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Pangaea to Plate Tectonics Report

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Pangaea to Plate Tectonics Summary

Not only does *The Urantia Book* say that the continents were once all connected as one land mass and that they broke up and then drifted apart, it also provides details about how this happened. Additionally, it addresses issues related to how various pressures affect the interrelationship of oceans, continents, the earth's crust, volcanoes, earthquakes, and mountain formation. Though the theory of continental drift had been around for a long time and some evidence in support of this theory had been developed prior to *The Urantia Book's* publication in 1955, the continental drift theory was very unpopular at the time of publication because scientists had not come up with an adequate explanation for how continents were able to move. In fact, seafloor spreading and plate tectonic theories, which brought continental drift theory into acceptance, had not yet developed.

Wikipedia puts it this way, "The acceptance of the theories of continental drift and sea floor spreading (the two key elements of plate tectonics) may be compared to the Copernican revolution in astronomy [when it was accepted that the planets move around the sun, not that everything moves around earth]. Within a matter of only several years geophysics and geology in particular were revolutionized. . . . What had been rejected for decades by any respectable scientific journal was eagerly accepted within a few short years in the 1960s and 1970s."

Going beyond a general description of the formation of the continents and mountain ranges, *The Urantia Book* also gives specific details about the sinking of a peninsula off the eastern coast of the Mediterranean some 33,000 years ago. Sonar technology had not developed sufficiently at the time of *The Urantia Book's* publication to provide a clear picture of the topography of the eastern Mediterranean basin. Today's more advanced sonar mapping reveals a topography between Cyprus and the coast of Syria that not only aligns with *The Urantia Book's* description, but also is located at the convergence of three highly active plates that produce an unusual crosscurrent of pressures. (**Go to the Garden of Eden Report** for a complete explanation about this now sunken peninsula.)

Pangaea to Plate Tectonics Review

This topic interrelates various geophysical issues. Additionally, it provides an opportunity to

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address not only a general discussion of Pangaea (the theory that the continents were once connected as one giant land mass), continental drift, seafloor spreading, plate tectonics, and the mechanism for this type of movement, but also a specific and circumscribed geophysical occurrence along the eastern coast of the Mediterranean.

Pangaea and continental drift theories were around long before *The Urantia Book's* publication. However, seafloor spreading and plate tectonic theories did not develop until after its publication; while the mechanism responsible for the continental drift and seafloor spreading had only been suggested without any scientific foundation having been developed. The variations in the development of science related to these issues makes it important to review the permissions and limitations that *The Urantia Book* asserts have guided its presentation of historical and scientific information. The key distinction is the difference between the permission to reveal historical facts and the limitation on revealing unearned scientific theories and understandings. *The Urantia Book* states:

We [the authors] are not at liberty to anticipate the scientific discoveries of a thousand years. . . We full well know that, while the historic facts. . . of this series of revelatory presentations will stand on the records of the ages to come, within a few short years many of our statements regarding the physical sciences will stand in need of revision in consequence of additional scientific developments and new discoveries. These new developments we even now foresee, but we are forbidden to include such humanly undiscovered facts in the revelatory records. (UB 101:4.2)(1)

Historic facts are distinguished from scientific facts. One finds in the second sentence of the above quote the assertion that “historic facts” “will stand on the records of the ages to come.” In contrast, the use of the word “facts” in the last sentence relates to the realm of scientific discoveries. These distinctions play a key role regarding the presentation in *The Urantia Book* of information related to Pangaea, continental drift, seafloor spreading, plate tectonics and the underlying mechanism for movement. Because the mechanism for movement is a matter of historic fact and had been at least suggested, direct statements are provided on this issue. Because the theory of continental drift was around long before *The Urantia Book's* publication, this terminology and theory is a permissible subject. Because theories about seafloor spreading and plate tectonics were not developed by the time *The Urantia Book* was published, these terms and theories are an impermissible subject. Consistent with these distinctions between historical fact and scientific fact, *The Urantia Book* has a whole section dedicated to continental drift, but never uses the words “seafloor spreading” or “plate tectonics,” Even though they are implied and alluded to, there are only limited and sometimes vague references to these theories as will be revealed in the course of the presentation of this report.

Notwithstanding that continental drift theory was around long before *The Urantia Book's* publication, it was still very much discredited at the time of publication. Because the scientific community largely rejected the theory before its main proponent, Alfred Wegener, suggested the mechanism for the motion (without supporting data to back it up), his suggestion received little attention.

The biggest challenge in presenting this topic has not to do with presenting the science, the history of the science, and *The Urantia Book's* position on these matters, but rather with presenting the overlapping aspects of the theories with respect to the time of *The Urantia Book's* publication. The approach being taken is to start with the issue of Pangaea and continental drift and the history of their acceptance and then get into the issues about seafloor spreading, tectonic plates, and the underlying mechanism. Lastly, the specific case of a now sunken peninsula off the eastern Mediterranean will be addressed.

When quotes are provided from *The Urantia Book* on these various issues, **bold** text will be used to draw attention to those aspects of the presentation that **do not** have to do with continental drift. This will be done to highlight those issues on which the *Urantia Book* was well ahead of scientific developments. Notwithstanding that continental drift theory was largely discredited when *The Urantia Book* was published, it nonetheless was around for over a hundred years prior to publication. Therefore, the continental drift issue, admittedly, does not add credibility to the authorship of the *Urantia Book* to the degree that the other issues do.

The majority of the relevant passages regarding continental drift are presented in this report first and all at once so that the reader can appreciate them as a whole and in relationship to how *The Urantia Book* integrates these statements into its broader presentation of the history of our planet.

(*The Urantia Book* uses the word “Urantia” as the name of our planet.) Additionally, reading through this material reveals that there is a host of other facts presented that may also be corroborated with further scientific developments regarding planetary history.

(Though exact reasons for the discrepancy are not given in *The Urantia Book*, radiometric dating, by *Urantia Book* standards, is only reliable up to 35,000,000 years ago. From 45,000,000 years ago to 500,000,000 years ago radiometric dating overestimates ages by a factor of 1.2 to 2.0 years. From 550,000,000 year ago and on the overestimations maintain consistently by a factor of 4.0 years. This apparently has something to do with changes in background radiation levels and/or certain types of energies that the authors of the *Urantia Book* were not given permission to discuss in any detail.)

The Urantia Book states:

800,000,000 years ago [3.2 billion years ago based on the current scientific standards for radiometric dating] witnessed the inauguration of the first great land epoch, the age of increased continental emergence.

Since the condensation of the earth's hydrosphere, first into the world ocean and subsequently into the Pacific Ocean, this latter body of water should be visualized as then covering nine tenths of the earth's surface. Meteors falling into the sea accumulated on the ocean bottom, and meteors are, generally speaking, composed of heavy materials. Those falling on the land were largely oxidized, subsequently worn down by erosion, and washed into the ocean basins. Thus the ocean bottom grew increasingly heavy, and added to this was the weight of a body of water at some places ten miles deep.

The increasing downthrust of the Pacific Ocean operated further to upthrust the continental land mass. Europe and Africa began to rise out of the Pacific depths along with those masses now called Australia, North and South America, and the continent of Antarctica, while the bed of the Pacific Ocean engaged in a further compensatory sinking adjustment. By the end of this period almost one third of the earth's surface consisted of land, all in one continental body. . .

750,000,000 years ago the first breaks in the continental land mass began as the great north-and-south cracking, which later admitted the ocean waters and prepared the way for the westward drift of the continents of North and South America, including Greenland. The long east-and-west cleavage separated Africa from Europe and severed the land masses of Australia, the Pacific Islands, and Antarctica from the Asiatic continent.

700,000,000 years ago Urantia was approaching the ripening of conditions suitable for the support of life. The continental land drift continued; increasingly the ocean penetrated the land as long fingerlike seas providing those shallow waters and sheltered bays which are so suitable as a habitat for marine life.

650,000,000 years ago witnessed the further separation of the land masses and, in consequence, a further extension of the continental seas. And these waters were rapidly attaining that degree of saltiness which was essential to Urantia life.” (UB 57:8.19-21, 23-25)

500,000,000 years ago [1 billion years ago based on current radiometric dating] primitive marine vegetable life was well established on Urantia. Greenland and the arctic land mass, together with North and South America, were beginning their long and slow westward drift. **Africa moved slightly south, creating an east and west trough, the Mediterranean basin, between itself and the mother body. Antarctica, Australia, and the land indicated by the islands of the Pacific broke away on the south and east and have drifted far away since that day.**” (UB 58:4.3)

The Continental Drift

The continental land drift continued. The earth's core had become as dense and rigid

as steel, being subjected to a pressure of almost 25,000 tons to the square inch, and owing to the enormous gravity pressure, it was and still is very hot in the deep interior. The temperature increases from the surface downward until at the center it is slightly above the surface temperature of the sun.

The outer one thousand miles of the earth's mass consists principally of different kinds of rock. Underneath are the denser and heavier metallic elements. **Throughout the early and preatmospheric ages the world was so nearly fluid in its molten and highly heated state that the heavier metals sank deep into the interior. Those found near the surface today represent the exudate of ancient volcanoes, later and extensive lava flows, and the more recent meteoric deposits.**

The outer crust was about forty miles thick. This outer shell was supported by, and rested directly upon, a molten sea of basalt of varying thickness, a mobile layer of molten lava held under high pressure but always tending to flow hither and yon in equalization of shifting planetary pressures, thereby tending to stabilize the earth's crust.

Even today the continents continue to float upon this noncrystallized cushiony sea of molten basalt. Were it not for this protective condition, the more severe earthquakes would literally shake the world to pieces. Earthquakes are caused by sliding and shifting of the solid outer crust and not by volcanoes.

The lava layers of the earth's crust, when cooled, form granite. The average density of Urantia is a little more than five and one-half times that of water; the density of granite is less than three times that of water. The earth's core is twelve times as dense as water.

The sea bottoms are more dense than the land masses, and this is what keeps the continents above water. When the sea bottoms are extruded above the sea level, they are found to consist largely of basalt, a form of lava considerably heavier than the granite of the land masses. Again, if the continents were not lighter than the ocean beds, gravity would draw the edges of the oceans up onto the land, but such phenomena are not observable.

The weight of the oceans is also a factor in the increase of pressure on the sea beds. The lower but comparatively heavier ocean beds, plus the weight of the overlying water, approximate the weight of the higher but much lighter continents. But all continents tend to creep into the oceans. The continental pressure at ocean-bottom levels is about 20,000 pounds to the square inch. That is, this would be the pressure of a continental mass standing 15,000 feet above the ocean floor. The ocean-floor water pressure is only about 5,000 pounds to the square inch. These differential pressures tend to cause the continents to slide toward the ocean beds.

Depression of the ocean bottom during the prelife ages had upthrust a solitary continental land mass to such a height that its lateral pressure tended to cause the eastern, western, and southern fringes to slide downhill, over the underlying semiviscous lava beds, into the waters of the surrounding Pacific Ocean. This so fully compensated the continental pressure that a wide break did not occur on the eastern shore of this ancient Asiatic continent, but ever since has that eastern coast line hovered over the precipice of its adjoining oceanic depths, threatening to slide into a watery grave.” (UB 58:5.1-8)

The above passages place the Urantia Book decisively on record in support of continental drift theory. Again, bear in mind that the first publication date of the Urantia Book is 1955 and that the nickel plates for printing the Urantia Book were transferred to the Urantia Foundation in 1950.

Regarding when and how the acceptance of continental drift effected the field of geophysics, Wikipedia.com states,

The acceptance of the theories of continental drift and sea floor spreading (the two key elements of plate tectonics) may be compared to the Copernican revolution in astronomy [when it was accepted that the planets move around the sun, not that everything moves around earth]. Within a matter of only several years geophysics and geology in particular were revolutionized. . . . What had been rejected for decades by any respectable scientific journal was eagerly accepted within a few short years in the 1960s and 1970s.(2)

These statements, however, may be somewhat overstated. The degree to which they may be overstated has not to do with the way the theory of plate tectonics revolutionized our appreciation of geophysics and geology, but rather with regard to how much respect there was for the development of continental drift theory in advance of developments about seafloor spreading and plate tectonics.

Prior to the 1960's, outside the United States and Europe there was more respect for continental drift theory than there was within the United States and Europe. The development of scientific theories, and therefore the research associated with scientific issues, unfortunately does fall prey to issues of ego, funding, national/cultural allegiances, etc. South African scholars were more sympathetic to the theory of continental drift, being in closer proximity to the evidence in support of the theory. Alfred Wegener was the biggest proponent of continental drift theory in the early 1900's. Even though there were geologic evidences, fossil records, and other data offering strong support for a past connection of Africa with South America, his professional life suffered greatly for his position on the subject. Wegener was a German scientist. The Hartebeesthoek Radio Astronomy Observatory puts it this way:

Of course, the "Drift" theory was not immediately accepted by Wegener's peers, as it is difficult in the world of science to change accepted or established doctrines or views. . .

In fact, he was bitterly attacked by many critics and these attacks eventually took their toll on his career. Despite his undisputed talents as a teacher and the continuing loyalty of his close associates, he was unable to obtain a professorship in a German university and eventually left Germany for the University of Graz in Austria.

Wegener's most compelling and enthusiastic support came from a South African geologist, Alexander Du Toit. South African scientists were far more favorably disposed to the idea of continental drift for a simple reason: All around them they could see a plethora of geological phenomena that closely resembled those of the other continents in the Southern Hemisphere. Du Toit spent five months in Brazil, Uruguay and Argentina amassing evidence. He found it difficult to believe that he was on another continent as not only did he find the same plant and animal fossils he knew at home, but he found them in the same complex sequence, embedded layer by layer in the rock. Du Toit was confident he had found conclusive proof that the continents were once joined.(3)

Continental drift theory was born with the advent of global mapping. Looking at a map of the globe, one cannot help but wonder if North and South America once fit together with Europe and Africa. But the issue of how continents could possibly drift apart needed to be answered. As comparative data developed the persuasiveness of this new information in support of continental drift was increasingly overshadowed by the lack of a theory for how it could possibly have happened. The history of the debate is important because it puts into perspective exactly where the Urantia Book initially stood in the course of these unfolding events. Though the Urantia Book was not published until 1955, the completed printing plates were transferred to Urantia Foundation in 1950, and solicitation for bids to publish the book took place in 1941. Answers.com frames the debate this way:

Before geophysical evidence started accumulating after World War II, the idea of continental drift caused sharp disagreement among geologists. Wegener had introduced his theory in 1912 at a meeting of the German Geological Association. His paper was published that year and expanded into a book in 1915. In 1921 the Berlin Geological Society held a symposium on the theory. In 1922 Wegener's book was translated into English and then it received a wider audience. In 1923 the theory was discussed at conferences by Geological Society of France, the Geological Section of the British Association for the Advancement of Science, and the Royal Geological Society. The theory was carefully but critically reviewed in the journal Nature by Philip Lake. On November 15, 1926, the American Association of Petroleum Geologists (AAPG)

held a symposium at which the continental drift hypothesis was vigorously debated. The resulting papers were published in 1928 under the title Theory of continental drift. Wegener himself contributed a paper to this volume (Friedlander 1995:21-27).

One of the main problems with Wegener's theory was that he believed that the continents "plowed" through the rocks of the ocean basins. Most geologists did not believe that this could be possible. In addition, Wegener did not have an acceptable theory of the forces that caused the continents to drift.(4)

Once a theory is debated by the scientific community and rejected, re-emergence and acceptance of the theory only comes after compelling evidence has been established. The Urantia Book was published in the wake of Wegener's general rejection. Even in 1950, when the printing plates that were completed some years earlier were officially given to the newly created Urantia Foundation, the theory of continental drift was still very much out of vogue. The more significant scientific developments that turned this around began in the early 1960's. According to the United States Geological Survey website:

Continental drift was hotly debated off and on for decades following Wegener's death before it was largely dismissed as being eccentric, preposterous, and improbable. However, beginning in the 1950s, a wealth of new evidence emerged to revive the debate about Wegener's provocative ideas and their implications. In particular, four major scientific developments spurred the formulation of the plate-tectonics theory: (1) demonstration of the ruggedness and youth of the ocean floor; (2) confirmation of repeated reversals of the Earth magnetic field in the geologic past; (3) emergence of the seafloor-spreading hypothesis and associated recycling of oceanic crust; and (4) precise documentation that the world's earthquake and volcanic activity is concentrated along oceanic trenches and submarine mountain ranges.(5)

Again **bold** print will be used to highlight those portions of the quotes below that pertain to those developments that occurred after the completion of the printing plates and publication. The Urantia Book states:

290,000,000 years ago [435,000,000 years ago by radiometric dating] the sea had largely withdrawn from the continents, and the bottoms of the surrounding oceans were sinking. The land masses were little changed until they were again submerged. The early mountain movements of all the continents were beginning, and the greatest of these crustal upheavals were the Himalayas of Asia and the great Caledonian Mountains, extending from Ireland through Scotland and on to Spitzbergen.

...

The great volcanic activity of this age was in the European sector. Not in millions upon millions of years had such violent and extensive volcanic eruptions occurred as now took place around the Mediterranean trough and especially in the neighborhood of the British Isles. This lava flow over the British Isles region today appears as alternate layers of lava and rock 25,000 feet thick. **These rocks were laid down by the intermittent lava flows which spread out over a shallow sea bed, thus interspersing the rock deposits, and all of this was subsequently elevated high above the sea. Violent earthquakes took place in northern Europe, notably in Scotland.** (UB 59:3.3,6)

150,000,000 years ago [240,000,000 years ago by radiometric dating] the early land-life periods of the world's history began. Life, in general, did not fare well but did better than at the strenuous and hostile close of the marine-life era.

As this era opens, the eastern and central parts of North America, the northern half of South America, most of Europe, and all of Asia are well above water. North America for the first time is geographically isolated, but not for long as the Bering Strait land bridge soon again emerges, connecting the continent with Asia.

Great troughs developed in North America, paralleling the Atlantic and Pacific coasts. The great eastern-Connecticut fault appeared, one side eventually sinking two miles. Many of these North American troughs were

later filled with erosion deposits, as also were many of the basins of the fresh- and salt-water lakes of the mountain regions. Later on, these filled land depressions were greatly elevated by lava flows which occurred underground. The petrified forests of many regions belong to this epoch.

The Pacific coast, usually above water during the continental submergences, went down excepting the southern part of California and a large island which then existed in what is now the Pacific Ocean. (UB 60:1.5-8)

Near the close of the preceding geologic period [Approximately 110,000,000 years ago according to the Urantia Book; approximately 165,000,000 years ago by radiometric dating.] much of the continental land was up above water, although as yet there were no mountain peaks. **But as the continental land drift continued, it met with the first great obstruction on the deep floor of the Pacific. This contention of geologic forces gave impetus to the formation of the whole vast north and south mountain range extending from Alaska down through Mexico to Cape Horn.**

This period thus becomes the modern mountain-building stage of geologic history. Prior to this time there were few mountain peaks, merely elevated land ridges of great width. Now the Pacific coast range was beginning to elevate, but it was located seven hundred miles west of the present shore line. The Sierras were beginning to form, their gold-bearing quartz strata being the product of lava flows of this epoch. In the eastern part of North America, Atlantic sea pressure was also working to cause land elevation. (UB 60:3.2,3)

80,000,000 years ago [112,000,000 year ago by radiometric dating] **great disturbances occurred in the earth's crust. The western advance of the continental drift was coming to a standstill, and the enormous energy of the sluggish momentum of the hinter continental mass upcrumpled the Pacific shore line of both North and South America and initiated profound repercussional changes along the Pacific shores of Asia. This circumpacific land elevation, which culminated in present-day mountain ranges, is more than twenty-five thousand miles long. And the upheavals attendant upon its birth were the greatest surface distortions to take place since life appeared on Urantia. The lava flows, both above and below ground, were extensive and widespread.**

75,000,000 years ago marks the end of the continental drift. From Alaska to Cape Horn the long Pacific coast mountain ranges were completed, but there were as yet few peaks.

The backthrust of the halted continental drift continued the elevation of the western plains of North America, while in the east the worn-down Appalachian Mountains of the Atlantic coast region were projected straight up, with little or no tilting.

70,000,000 years ago the crustal distortions connected with the maximum elevation of the Rocky Mountain region took place. A large segment of rock was overthrust fifteen miles at the surface in British Columbia; here the Cambrian rocks are obliquely thrust out over the Cretaceous layers. On the eastern slope of the Rocky Mountains, near the Canadian border, there was another spectacular overthrust; here may be found the prelife stone layers shoved out over the then recent Cretaceous deposits.

This was an age of volcanic activity all over the world, giving rise to numerous small isolated volcanic cones. Submarine volcanoes broke out in the submerged Himalayan region. Much of the rest of Asia, including Siberia, was also still under water. (UB 60:3.11-15)

The great Cretaceous period was drawing to a close. . .

This period also witnesses the end of the continental drift and the building

of the modern mountains of Urantia. But the pressure of the continental masses and the thwarted momentum of their agelong drift are not the exclusive influences in mountain building. The chief and underlying factor in determining the location of a mountain range is the pre-existent lowland, or trough, which has become filled up with the comparatively lighter deposits of the land erosion and marine drifts of the preceding ages. These lighter areas of land are sometimes 15,000 to 20,000 feet thick; therefore, when the crust is subjected to pressure from any cause, these lighter areas are the first to crumple up, fold, and rise upward to afford compensatory adjustment for the contending and conflicting forces and pressures at work in the earth's crust or underneath the crust. Sometimes these upthrusts of land occur without folding. But in connection with the rise of the Rocky Mountains, great folding and tilting occurred, coupled with enormous overthrusts of the various layers, both underground and at the surface.

Biologically as well as geologically this was an eventful and active age on land and under water. (UB 60:4.1,5)

Having now reviewed the majority of the material in the Urantia Book that pertains to the scientific developments that validated the continental drift theory, it is time to again return to the historical unfolding of these advancements. The Southern California Integrated GPS Network website continues the story and corroborates what the Urantia Book says about a basalt layer being involved in the mechanism that allows continental drift to occur:

Following World War II, even more evidence was uncovered which supports the theory of plate tectonics. In the 1960's a world-wide array of seismometers were installed to monitor nuclear testing, and these instruments revealed a startling geological phenomenon. It showed that earthquakes, volcanoes, and other active geologic features for the most part aligned along distinct belts around the world, and those belts defined the edges of tectonic plates.

In addition, further paleomagnetic studies revealed a striped pattern of magnetic reversals in the crust of the ocean basins. Basalt contains a fair amount of magnetic minerals called magnetite. When the lava from spreading centers in the oceans forms and cools, these minerals align to the north pole. The Earth has undergone several magnetic reversals in the past, in which the north and south poles are reversed for a period of time. When geologists and geophysicists discovered that the crust in the ocean recorded these reversals, it was even more positive proof that the lithosphere had to be in motion, otherwise there would be no "stripes" of normal and reversed polarity crust.

These were some of the final pieces of the puzzle that led to the development of modern plate tectonic theory. Since its emergence in the 1960's, plate tectonic theory has gained wide-spread acceptance as the model of Earth processes.(6)

VolcanoWorld (A Collaborative Higher Education, K-12, and Public Outreach project of the North Dakota and Oregon Space Grant Consortia, administered by the Department of Geosciences at Oregon State University) continues the story of the acceptance of Continental Drift Theory with additional details:

In 1962, a geologist presented an explanation for the global rift system. Harry Hess proposed that new ocean floor is formed at the rift of mid-ocean ridges. The ocean floor, and the rock beneath it, are produced by magma that rises from deeper levels. Hess suggested that the ocean floor moved laterally away from the ridge and plunged into an oceanic trench along the continental margin.

A trench is a steep-walled valley on the sea floor adjacent to a continental margin. . . In Hess' model, convection currents push the ocean floor from the mid-ocean ridge to the trench. The convection currents might also help move the continents, much like a conveyor belt.

As Hess formulated his hypothesis, Robert Dietz independently proposed a similar model and called it sea floor spreading. Dietz's model had a significant addition. It

assumed the sliding surface was at the base of the lithosphere, not at the base of the crust.

Hess and Dietz succeeded where Wegener had failed. Continents are no longer thought to plow through oceanic crust but are considered to be part of plates that move on the soft, plastic asthenosphere. A driving force, convection currents, moved the plates. Technological advances and detailed studies of the ocean floor, both unavailable during Wegener's time, allowed Hess and Dietz to generate the new hypotheses.”(7)

The new hypotheses of the early 1960s explained several puzzling sets of observations. All that remained was a synthesis of these hypotheses.

The synthesis began in 1965 when Tuzo Wilson introduced the term plate for the broken pieces of the Earth's lithosphere. In 1967, Jason Morgan proposed that the Earth's surface consists of 12 rigid plates that move relative to each other. Two months later, Xavier Le Pichon published a synthesis showing the location and type of plate boundaries and their direction of movement.

Since the mid-1960s, the plate tectonic model has been rigorously tested. Because the model has been successfully tested by numerous methods, it is now called the plate tectonic theory and is accepted by almost all geologists.(8)

Of course, not everyone was immediately impressed by these developments. New theories are not always accepted easily. And old theories that have been rejected make a come back even more slowly. Answers.com reports that:

[A]cceptance was gradual. Nowadays it is universally supported; but even in 1977 a textbook could write the relatively weak: "a poll of geologists now would probably show a substantial majority who favor the idea of drift" and devote a section to a serious consideration of the objections to the theory (Davis, 1977).(9)

Now having come to the end of the history of the acceptance of continental drift theory, one can better appreciate just where the *Urantia Book* has stood with respect to this issue. Looking again at the some of the key statements regarding the mechanism of continental drift, it is apparent that not only has science caught up with the general theory that drift has occurred, it has also developed a theory for the mechanism of this drift that parallels to the *Urantia Book's* description of these events. Quoting once more from the section in the *Urantia Book* that is titled Continental Drift:

This outer shell was supported by, and rested directly upon, a molten sea of basalt of varying thickness, a mobile layer of molten lava held under high pressure but always tending to flow hither and yon in equalization of shifting planetary pressures, thereby tending to stabilize the earth's crust.

Even today the continents continue to float upon this noncrystallized cushiony sea of molten basalt. Were it not for this protective condition, the more severe earthquakes would literally shake the world to pieces. Earthquakes are caused by sliding and shifting of the solid outer crust and not by volcanoes.” (UB 58:5.3,4)

Phil Calabrese's paper, *The Coming Scientific Validation of the Urantia Book*, (see Null Hypothesis) attributes a percentage to the acceptance to continental drift theory during the time period when *The Urantia Book* was in the process of being published. Doing so was necessary for the purpose of that paper, namely to estimate the probability of a human being (or group of human beings) being correct on the various issues in the *Urantia Book* that were disfavored by scientists when the book was published. Assessing the accuracy of that percentage is not the purpose of this report. What is important for the purpose of this report is simply to appreciate that the eventual acceptance of continental drift theory and the later development of the theories of seafloor spreading and plate tectonics all lends credibility to *The Urantia Book*.

The last issue to address is the *Urantia Book's* assertion that a peninsula once existed off the eastern coast of the Mediterranean. This topic is more extensively covered in the Garden of Eden section of UBtheNEWS. However, because there are overlaps between that topic and this one, the aspects that deal specifically with plate tectonics are presented here as well.

The Urantia Book describes a peninsula that jutted out from the eastern shore of the Mediterranean. It gives specific details about the shape, size, and topography of this peninsula.

Approximately 33,000 years ago this peninsula is said to have sunk into the Mediterranean. The Garden of Eden Report primarily addresses the fact that we did not have detailed bathymetric maps of the Mediterranean seafloor at the time the *Urantia Book* was published. That report covers the development of bathymetric mapping with advancements in sonar technology.

An additional facet of the Garden of Eden Report that is relevant to this topic as well is the location and nature of the tectonic plates in that region. Because tectonic plate theory had not developed when *The Urantia Book* was published, tectonic plate mapping, naturally, was not part of our scientific understanding of geophysics at that time. However, before reviewing the relationship of the tectonic plates in that region to the description of the Garden of Eden, it is important to first get an appreciation of what *The Urantia Book* says on the subject and what current bathymetric maps reveal about the area.

The Urantia Book provides the following description of the Garden of Eden and its fate:

The committee on location . . . reported favorably concerning three possible locations: The first was an island in the Persian Gulf; the second, the river location subsequently occupied as the second garden [between the Tigris and Euphrates rivers]; the third, a long narrow peninsula -- almost an island -- projecting westward from the eastern shores of the Mediterranean Sea.

...

This Mediterranean peninsula had a salubrious climate and an equable temperature; this stabilized weather was due to the encircling mountains and to the fact that this area was virtually an island in an inland sea. While it rained copiously on the surrounding highlands, it seldom rained in Eden proper. But each night, from the extensive network of artificial irrigation channels, a "mist would go up" to refresh the vegetation of the Garden.

The coast line of this land mass was considerably elevated, and the neck connecting with the mainland was only twenty-seven miles wide at the narrowest point. The great river that watered the Garden came down from the higher lands of the peninsula and flowed east through the peninsular neck to the mainland and thence across the lowlands of Mesopotamia to the sea beyond. It was fed by four tributaries which took origin in the coastal hills of the Edenic peninsula, and these are the "four heads" of the river which "went out of Eden," and which later became confused with the branches of the rivers surrounding the second garden." (UB 73:3.1,3,4)

The architectural plans for Eden provided homes and abundant land for one million human beings. (UB 73:5.1)

[A]lmost four thousand years after Adam left the Garden . . . , in connection with the violent activity of the surrounding volcanoes and the submergence of the Sicilian land bridge to Africa, the eastern floor of the Mediterranean Sea sank, carrying down beneath the waters the whole of the Edenic peninsula. Concomitant with this vast submergence the coast line of the eastern Mediterranean was greatly elevated. And this was the end of the most beautiful natural creation that Urantia has ever harbored. The sinking was not sudden, several hundred years being required completely to submerge the entire peninsula. (UB 73:7.1)

The Adamic family grounds embraced a little over five square miles. Immediately surrounding this homesite, provision had been made for the care of more than three hundred thousand of the pure-line offspring. (UB 74:6.1)

Figure 1 shows that there is only one location along the eastern Mediterranean that could fit this description. Figure 2 reveals details that more fully demonstrate how well this area matches up to *The Urantia Book's* description of the peninsula. The area to consider is, of course, between Cyprus and the eastern coast of the Mediterranean. The raised areas correspond to the description of the mountains that surrounded the coastline of the peninsula. See the Garden of Eden Report for a full analysis of how well this area matches up in terms of size and distance with the *Urantia Book's* description.



Figure 1: National Geographic 1982

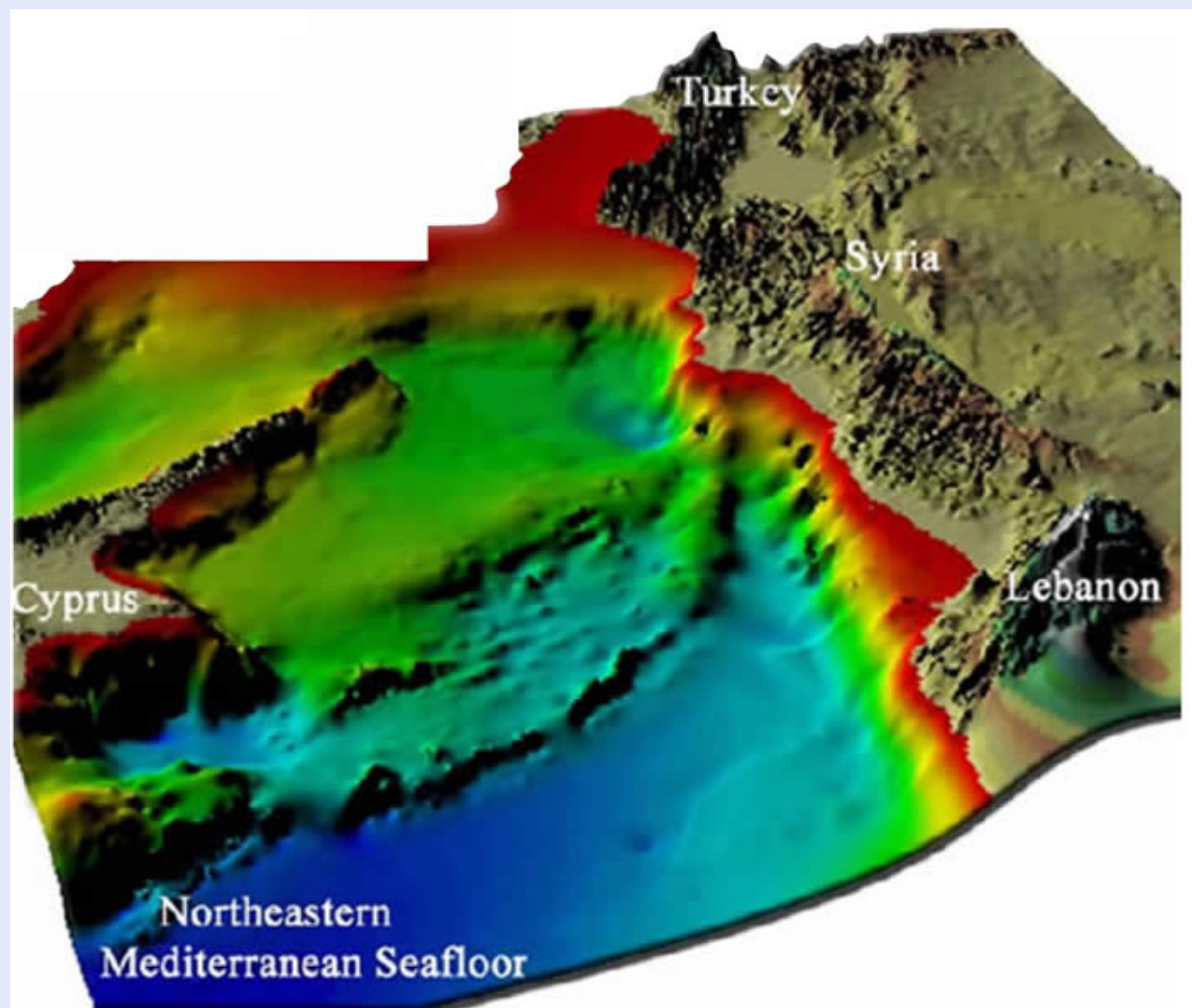


Figure 2: from 1989 Russian sonar readings

More directly related to this topic is the plate tectonic map shown in Figure 3.

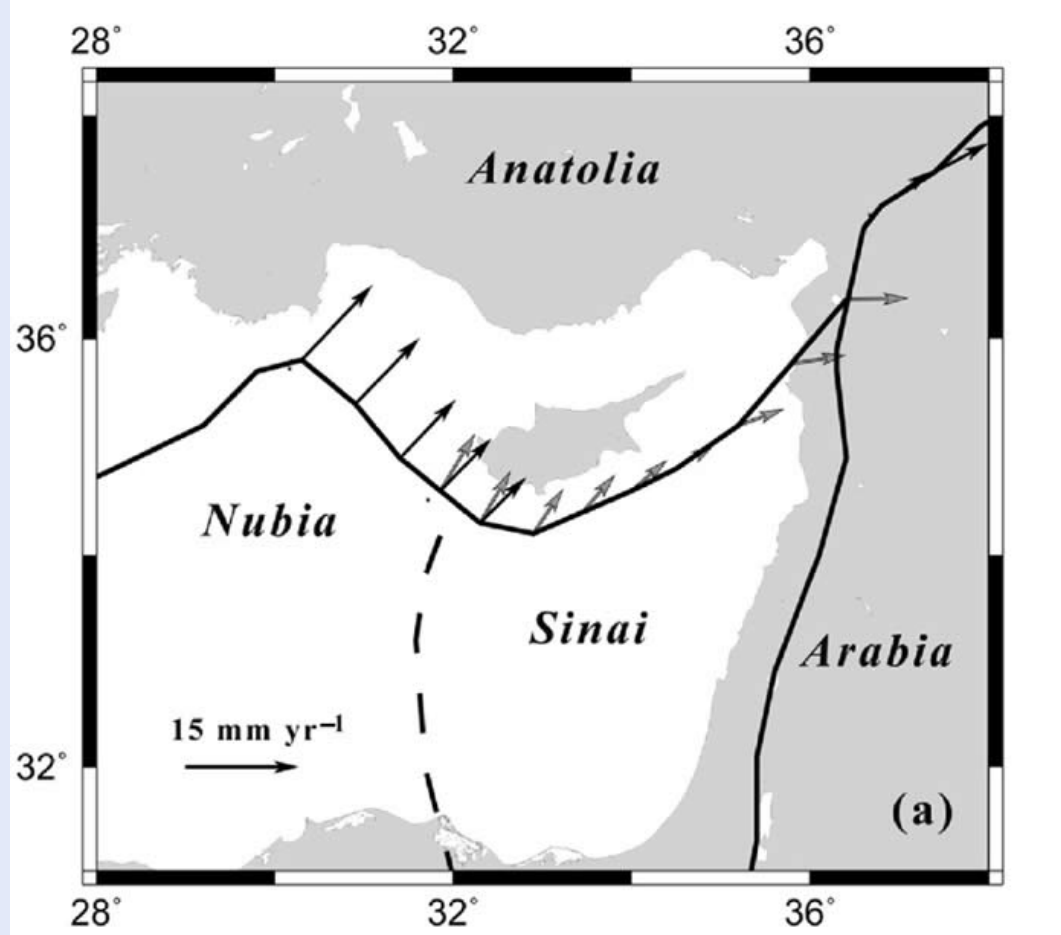


Figure 3: Tectonic Plates

The geophysics of the eastern Mediterranean basin is unusual as well as being active, both currently and historically. A 2005 article in *Geophysics Journal International* explains these characteristics to some degree, while also acknowledging that there is still more to learn.⁽¹⁰⁾ This area marks the convergence of three tectonic plates. Plus, Cyprus exhibits independent characteristics. According to the article, “[M]cClusky et al. (2000) present in their maps two arcs, one north and the other south of Cyprus, suggesting that Cyprus behaves as an independent block and moves independently from the Anatolian plate.”

From the same article referenced above, one learns that the “Cyprian Arc is subjected to subduction, collision and transcurrent tectonic processes.” Unlike the western side of the arc, where the Nubia plate primarily is experiencing a process of subduction (pushing under the Anatolia plate), the eastern side of the arc is experiencing the full range of forces just mentioned. Of course, a full reading of the article provides a much better understanding of these processes. Nonetheless, the way the direction of the arrows changes in Figure 3 provides a basic appreciation for how this area is subjected to a confluence of forces.

Note in Figure 2 how the northern side of the elevated range (coming off the Syrian coast and extending out to Cyprus) breaks line and is further south as it approaches Cape Creco on southeastern tip of Cyprus. Perhaps this indicates evidence of displacement occasioned by the sinking of this region. It is also of interest that this northern ridge of the peninsula is less pronounced than the southern range of hills. Perhaps this is due to the confluence of subduction and other forces along the fault line.

Interpreting the specifics of how this area might have sunk into the Mediterranean is admittedly speculative. What is not speculative is that the general topography matches up with the *Urantia Book*’s description of a “long narrow peninsula” with “encircling mountains,” and that the area could have held the number of inhabitants specified. Additionally, what is not speculative is that this area could only be precisely identified after technologies developed after the *Urantia Book*’s publication provided a clear picture of the eastern Mediterranean basin. And to top it all off, tectonically speaking, few places on earth are as geologically active and have the distinct peculiarities associated with the convergence of three plates as this particular location, which is exactly where the Garden of Eden would have been located according to the *Urantia Book*’s description.

Footnotes:

- (1) Citations for the *Urantia Book* are presented in this form. In the instant case, (UB 101:4.2) means Chapter 101, section 4, paragraph 2. The *Urantia Book* actually uses the term “Papers” to refer to chapters.
- (2) http://en.wikipedia.org/wiki/Plate_tectonics

- (3) <http://www.hartrao.ac.za/geodesy/tectonics.html>
 - (4) <http://www.answers.com/topic/continental-drift>
 - (5) <http://pubs.usgs.gov/gip/dynamic/developing.html>
 - (6) <http://scign.jpl.nasa.gov/learn/plate2.htm>
 - (7) http://volcano.und.nodak.edu/vwdocs/vwlessons/plate_tectonics/part8.html
 - (8) http://volcano.und.nodak.edu/vwdocs/vwlessons/plate_tectonics/part11.html
 - (9) <http://www.answers.com/topic/continental-drift>
 - (10) http://www.geodesy.miami.edu/articles/Wdowinski_et_al_2006_JGI.pdf
-

Pangaea to Plate Tectonics Additional Links

Jack Oliver

<http://www.sciencedaily.com/releases/2009/02/090211122136.htm>

<http://www.infoplease.com/ce6/sci/A0813370.html>

<http://www.scotese.com/futanima.htm>

<http://pubs.usgs.gov/gip/dynamic/unanswered.html>

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