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MINISYMPOSIUM ON OROGENY—PART III

MOUNTAINS, METEORITES AND PLATE TECTONICS

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Abstract

The concept of plate tectonics with its corollary, continental drift, have been espoused by various creationists who have adapted them to fit the short time-span of young-earth catastrophism—Northrup (1968, 1970, 1977, 1979, 1980), Austin (Nevins) (1978), Tippett (1979), Elliott (1977), and Hansen (1983). Dwelling on the evidence that the continents at first were united, with the sea floor later spreading, these workers and I have envisioned an abrupt continental drifting and separation occurring much more rapidly than our uniformitarian colleagues would allow. My conclusion is that the physical evidences for rapid plate movement are found practically universally.

Introduction

The scenario of plate tectonics has also been applied to the creationist view of plant origins and distribution—Howe (1979) and Northrup (1979). Northrup (1977, 1979) and Hansen (1983) also evaluate human racial divisions in terms of rapid continental movement.

While I shall discuss the role of plate tectonics after the Flood in forming mountains, I believe there was a very important period of orogeny during the third day of creation (Genesis 1:9-11) and am presently preparing a paper to deal with those earlier events.

Did Continental Rifting Occur During the Flood or Afterwards?

In turning to this creation literature on tectonics, the reader must realize that some creation theorists — e.g. Nevins (1978) and Barker (1977)—have postulated that the rifting of continents took place during the Flood. I believe, however, that it occurred sometime *after* the Flood, as I indicated earlier:

Identification of continental division with the Flood ignores the obvious evidence in Africa, Israel, Lebanon and Turkey that the African Rift and its northern extension were formed long after the emergence of that area from the sea. Whether Job be properly identified with Jobab (Genesis 10:29) or not, as I have suggested, the book of Job nevertheless contains a remarkable amount of references to rifting, diastrophism, massive tidal activity and similar phenomena. I insist that this requires man to be present in Palestine during the later stages of continental rifting. And we must not ignore the fact that the Jordan Rift rends Paleozoic and Mesozoic structures. It separated long after

they were deposited by the Noahic Flood and its gradual retreat. The Paleozoic deposits in Israel indicate that the sea transgressed and retreated repeatedly for late Paleozoic strata reoccur between terrestrial rocks. The same is true for Mesozoic deposits, but here the transgressions of the sea are less frequent and are interbedded by wind and surface erosion deposits in the Nubian sandstones. Both deposit series must relate to Genesis 7:21-8:3. Northrup (1977), pp. 2-6.

I must add, the Mesozoic gives evidence of relating to the long period of the retreat of the Flood which, I conclude, lasted for several centuries. Another paper on the unlikelihood of orogeny occurring during the Flood is being prepared.

If the continental separation transpired at the same time as the Flood event, we would expect the ocean floor now to contain Paleozoic (Flood) deposits. Since there are very few Paleozoic sediments in ocean basins, the rift must have occurred well after the Flood. Since what uniformitarian geologists call "Paleozoic" are the Flood deposits, I use the terms "Mesozoic" and "Cenozoic" to refer to relatively short postFlood periods of sedimentation, lasting only hundreds of years and involving such events as tidal waves, wind storms, mountain formation and glacial action—Northrup (1977). "Precambrian" beds thus relate to preFlood events.

Possibly the Resulting Subterranean Heat Helped Make Mountains

There is a tremendous amount of subterranean heat that has been released through the crust in earth's great volcanic upheavals. When one examines the extrusives which blanket millions of square miles of the continental surfaces, erected enormous mountain ridges and built vast plateaus and island platforms, one must ask where it originated. Mesozoic and Cenozoic entrenchments, uplifts, overthrusts, extrusions and explosions are a powerful testimony to the fact that something generated enormous heat at about the middle of the

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Jurassic that continued into the recent period of the Cenozoic. If the Creator rapidly rifted the continents, much heat would have been generated. During the postFlood years this surplus of heat may have been His instrument used in the erection of mountain ridges, plateaus and island platforms.

Possibly PostFlood Volcanism Caused the Ice Age

The effect of the vast heat produced by continental movement a few centuries after the Flood played a part in the catastrophic weather patterns that troubled earth for many generations. I believe that it also triggered an "ice age" perhaps for a generation that is referred to constantly in the book of Job. My discussion of this and the implications of some of the evidences largely have been ignored or missed by creationists. I conclude that it happened as follows: The vast upwellings of molten rock locally raised temperatures, whether beneath the sea or on the surfaces of the continents. This was accompanied by the extrusion of many trillions of gallons of super heated steam into the atmosphere. It also was accompanied by vast explosions of particulates into the atmosphere. The explosions of Karakatoa, the valley of 10,000 smokes, St. Helens, Lassen and the millions of other vents which have littered the crust of the earth all contributed their atmospheric trash to the growing density of the layer of atmospheric moisture. This atmospheric condition continually built from the beginning of the Cenozoic until its precipitation reached a peak. Temperatures had plunged steadily after the close of the Cretaceous period. By the beginning of the Pleistocene period this condition had become so severe that the albedo of the earth was totally changed. Solar heat, so necessary to the maintenance of surface temperatures, now was reduced so dramatically that earth's greatest snowstorms began. More temperate areas of the world suffered the world's greatest rainfalls. Great canyons like the Black Canyon of the Gunnison, the Green River Canyon, the Snake River Gorge, the Columbia River Gorge and Grand Canyon were carved through uplifting and stabilized structures by the rapid movement of ice melt, rainfall and abrupt precipitation basin drainage.

Is it merely coincidental that Earth's great volcanoes have been ground, chewed, gouged and polished by moving ice after their formation? Or is there a cause and effect relationship? Is it merely coincidental that the Jordan/African Rift, the product of mild plate separation, has been harshly eroded along its edges by intense precipitation, its long grabens often filled hundreds of feet by that rainfall to form great post-Flood lakes? Or does this evidence give testimony to a Biblical cause and effect relationship? Is it merely coincidental that the leading edges of the great continental plates have suffered by far the greatest distortion to be found along their edges? Or is this one of the multitude of evidences that something, some powerful unidentified power source almost beyond human imagination, was used by the Lord in ". . . setting the bounds of the nations" (Acts 17)?

Interested readers will find that I have dealt extensively with this important tie between volcanism and ice in the postFlood world in an earlier essay—Northrup (1977). Hansen (1983) has subsequently also argued

that many mountains were formed by rapid rifting and that even the deep freezing of mammoths (like the one at Beresovka) must tie in with tectonics:

The condition of the animal (the mammoth) itself along with the circumstances surrounding its death indicate a very unusual situation transpired there, possibly violent and extensive tectonic activity. p. 207.

Do Plate Tectonics Die for Lack of a Suitable Mechanism?

Creationist workers C. L. Burdick (1980) and R. Daly (1984) have each asserted that no matter how tempting the evidence appears from fossils or geography for fitting the continents together, all plate tectonics views falter for lack of a mechanism sufficient to cause such rifting and movement. What on Earth or what in the universe, for that matter, could have possibly generated the titanic forces needed to yield such massive shifts? What could have driven South America westward so forcefully as to produce the Humboldt Trench, the great rift valley that skirts and follows the sinuous Cordilleran ridge of its leading edge? What could have generated the shock wave needed to drive Africa far to the east and also hundreds of miles northward?

This problem of a mechanism is the crucial question facing anyone who postulated major plate movement, whether as the *danse largo* movement of uniformitarians or as the vivace transition necessary for the scenario to fit Biblical history. There is no force *on Earth* capable of producing such extensive kinetic energy.

Astral Catastrophism Was the Main Force for Moving Continents.

If indeed plate tectonics is the correct model to account for mountain building, we must look to the universe to find the force involved. Perhaps as creationists we have been guilty of ignoring the astute observations of Alan O. Kelly. He first coauthored with Dache (1953), a well-known astro-geologist, who has taught for years in Pennsylvania. Since then, Kelly has written several essays which support and expand his original conclusion that the earth has been subjected to as intense and severe damage by astral impacts as the lunar surface obviously has—(1963, a, b, c, 1966, 1985). In these he proposed that the greater circle of Hudson Bay is an ancient impact site. I suspect that it may have been related to a brief surge of continental movement which widened and deepened the ocean bottoms to receive the runoff of the continents. On the other hand, that particular comet may have related instead to the violent pre-Adamic uplift of the original great single continent in the third day of creation—an event which led to the creation of some of the so-called Precambrian strata.

Kelly also suspected that the Gulf of Mexico was a giant impact site, most likely formed at the crucial and violent transition between the Mesozoic and Cenozoic "eras"—which I would put in postFlood years.

Kelly alludes to another very interesting possible impact site on the southeast coast of the United States which in my view may have triggered the mid-Atlantic rift. He points to the arcuate orientation of the Appalachians and the Endless Mountains of Pennsylvania as

evidence. Kelly shows that these follow the curve of a compass swung around the Bermuda Islands, speculating that this center might be the corollary of similar mountains in the center of moon maria impact sites.

I have also wondered about the remarkable, fine granites which I have seen in central Georgia, Maine, and in Pennsylvania, and am considering the possibility that these are reworked crustal material which has been intruded as sills and domes under the impact crater rim. This crater impact also would explain the post-Flood hardening of the eastern beds of lignites into anthracite while those farther west slowly grade downward through soft coals to lignites. If the East Coast is a crater rim, the fact has been largely obscured by massive tsunamis as the continental blocks moved apart. Such a possible impact site might have imparted the energy at the right time to begin the major rifting process. Unfred (1984) has likewise envisioned that asteroidal impacts have shifted the earth's axis of rotation which he believes led to rifting, compression and mountain building.

As I affirm these proposed links between astral impacts and continental rifting, it is with some hesitation and question. One wonders, for example, how life itself could have survived during such catastrophic events. One is reminded of recent discussion by scientists concerning the danger of nuclear war plunging the earth into a long winter or ice age.

It is remarkable that uniformitarians become very catastrophic in their thinking when they consider how continents were separated and mountains uplifted: yet they object to the Creator using catastrophes to "set the bounds of the nations," Acts 17. But there is a problem with our creationist approach. In examining, correlating and digesting the mass of worldwide evidence for catastrophism, we squabble over our pet theories, holding the pronouncements of our favorite Christian theorists as inviolable products of inspiration. We have a tendency to become remarkably uniformitarian and more dogmatic than those uniformitarian researchers whose conclusions we so vigorously oppose. Therefore, a symposium like this in which several workers patiently share and compare their very different creationist views of orogeny should have considerable research value.

Summary

There are many books and papers in which the authors have attempted to show how the various mountain ranges and plateaus of the North American Southwest were caused by continental rifting. The reader may consult Nations and Stump (1981) and Chronic (1983) as examples. The catastrophist advocate of plate tectonics like myself would simply ratify these same processes at a much-collapsed time scale, and would assume that the mountain ridges grew for the most part after the Flood and as a result of this rapid continental movement which was quite possibly triggered and motivated by astral impacts.

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Questions, Comments, and Replies:

Question from Morton to Northrup:

I have thoroughly enjoyed Northrup's articles. He appears to know his geological facts and the problems they present to the monocatastrophists. He and I may never agree as to the mechanism of continental separation but I respect his position and views because he has considered the evidence. The following questions I shall ask are the same ones I pose to every believer in continental drift.

Rapid rifting as proposed by Northrup would produce massive amounts of heat. Thus if plate tectonics were simply accelerated to fit within a creationist time frame, severe problems would arise. For example, if a match is rubbed very slowly along one's trousers, nothing happens. But if the head of the same match is rubbed rapidly against the pants, it will light! In each case the same amount of energy is generated. In the slow motion instance the energy is dissipated and does not build up to cause ignition of the sulfur. In the rapid case, the temperature in the match head rises to the kindling point before the heat energy is dispersed. A similar situation would have occurred if continental drift had been accelerated. The frictional heat would have been generated so rapidly that the earth would have literally melted and/or ignited if plates moved as rapidly as creationist continental drift believers assume—(Morton, G. R. 1981. Creationism and continental drift. *CRSQ* 18:42-5.)

Northrup's reply: There was a great quantity of heat generated I believe. As indicated earlier, this heat

helped both directly and indirectly to form mountains because coastal ranges were formed in the process of subduction and volcanoes poured out the vast beds of lava which now occur as structural parts of plateaus and mountains.

Howe's comment: If the Creator did use rapid rifting of continents after the Flood, it is possible that the expected oversupply of heat was either supernaturally prevented from forming or else quickly dispersed during the rifting process. While this is possible, it does not submit to experimental analysis and it admittedly involves miracles not directly mentioned in the Bible.

Question from Morton to Northrup: If the present distribution of continents arose by rapid rifting, why is Antarctica surrounded by a ridge which encloses twice its area? This arrangement would seem to require a convectional sink in the center of Antarctica in terms of plate tectonics, a zone of subduction in the middle! Everywhere else that drift postulates a downward convectional stream, earthquakes occur in great numbers. Yet on Antarctica no known earthquakes have ever been recorded in spite of numerous observatories there.

Northrup's reply: This is truly a problem for plate tectonics theorists which deserves further consideration. This does not mean that any other views to explain these data are devoid of problems, however. One might ask "Why is there not a girdle of suboceanic mountains around each of the continental blocks if they were all caused by radius expansion as you believe?" Why is this supposed evidence for radius expansion limited to Antarctica?

Question from Morton to Northrup: If Africa arose by plate tectonics, why is it surrounded by a ridge system which is a bloated caricature of that continent? The mid Atlantic ridge is supposedly an upwelling area, while the 90° east ridge on the other side of Africa is an upwelling zone as is also the east African rift system. Thus it would appear that we have a set of convection cells with three areas of upwelling and no zone of subduction in between, as plate tectonics would seemingly demand. That would seem to be physically impossible.

Northrup's reply: Perhaps this is so! It would require more detailed study of the matter on the part of all of us in hope of finding a solution.

Question from Morton to Northrup: According to paleomagnetism all of the northern continents are more northerly now than in the past. This means that the Arctic Ocean must be shrinking in size. Local geology, however, requires that the Arctic Ocean be expanding because there is a midoceanic ridge down the middle of the Arctic Ocean. Thus drift requires that the Arctic Ocean be getting bigger and smaller at once. How can this be answered in terms of plate tectonics? There is an explanation according to the expansion model in that the Arctic Ocean gets physically larger while expansion is occurring. Since mathematically, the distance between two latitude lines on a larger earth is greater than on a smaller one, the paleomagnetic evidence is merely an artifact of expansion as the latitude lines have moved more than the continent.

Northrup's reply: I am pleased that you have pointed out the problem, one deserving much more thought. I

have no answer at the present. Perhaps this will become the basis of a future study on my part.

Comment from Waisgerber to Northrup: Northrup concludes that the many deposits of geological history cannot possibly be accounted for in a single monocaustrophic model. Northrup is correct in this conclusion, in my opinion. In Los Angeles County, for example, there are so many objections to the Flood-making-all-geology-model that a book could easily be written discussing the evidence. Northrup's articles should be required reading for those who believe that The One Flood did all geologic work. If his articles do nothing else they will explain to those who hold to a single creationist explanation that their view can be easily eliminated by scientific evidence.

Northrup is also correct (1979) in quoting George Howe, that scientists must go into the field to examine the evidence. The greatest barrier to creation scientific studies is presupposition based on a strident interpretation of Scripture. One alternative to Northrup's view of rapid continental rifting, however, is an idea that geologists have long held; that a few thousand years ago, the oceans of the world were probably about 300 feet lower in elevation than they are today. This would suggest that within the world of thousands of years ago, there were lands which connected one with another. Then came a melting of ice caps which caused the oceans to rise and isolate lands one from another. The lands were divided by water, in this view, without the need for continental drift. Data about the Mediterranean Sea indicate that the ocean level was considerably lower long ago than it is today.

Reply by Northrup: There are very few areas where legitimate land bridges would develop as earth's surface water became entrapped above sea level in Pleistocene ice. Those bridges that then existed do not provide adequate means for the immigration of life from Ararat to the present continental blocks—see Northrup (1977).

Land bridges, as a fragment of the past, were long ago discarded as a means of explaining most floral and faunal migration and interrelationship between opposing continents. They have been put to rest (and should be left there) by the very instructive results of the ocean floor borings done by the Glomar Challenger.

Comment from Waisgerber to Northrup: If there is one area in which Northrup can be challenged it is his apparent belief that words such as Paleozoic, Mesozoic, and Cenozoic are actually intervals of geologic time. Stratigraphers of the middle 20th century have virtually abandoned the time of these "eras" (Paleozoic, etc.) as being truth. They even question periods of time such as Triassic, Jurassic, and Cretaceous. So it is unwise for creationist geologists to embrace and adapt these ideas when they are being abandoned even by secular thinkers.

Reply by Northrup: I am well aware that there are many unwarranted assumptions in the geological column. However, I have found sufficient concord between its summary of the sequence of the structures that record earth's history and my own field studies on four continents to continue using the terminology. Without it we have no point of reference as we discuss evidence with the uniformitarian. Without it we begin

to loose contact with the very real physical evidence left for us by earth's great geological catastrophes.

Comments by Waisgerber to Northrup: Plate tectonics is but one current theory which supposedly explains earthquakes, the development of some land forms and the existence of some rock formations. In 25 years I predict that this model will fail, just as have all previous models for the development of the earth's crust. Creationists should use plate tectonics only in a very tentative way.

Concerning the evidence for one original continent, I believe that stratigraphic and paleontologic data merely suggest that all continents were connected at one time (perhaps only by way of land bridges). The distribution of sedimentary formations and the distribution of fossil life within existing continents suggest that these connected continents were under water for the most part.

On the other hand, I do not believe that plate tectonics should be totally abandoned as a possible model just because a suitable mechanism is not presently apparent. It would be acceptable to sustain it on the basis of other evidence alone, with or without a mechanism. I believe as Burdick has cautioned, that creationists should react only very slowly in accepting any theory put forth to explain our globe. They should continue to evaluate the evidence for and against plate tectonics.

Reply by Northrup: This is precisely my point. My catastrophe series harmonization model is nothing more than a model, an attempt to explain the physical data which we find (or which we as creationists should be finding and observing) in the physical geological record. As a theologian and Old Testament scholar who honors the text of the Bible as the Word of God, I insist that the physical data which I or others have found in the earth's crust must eventually be found to be in perfect agreement. One source of information comes from the handiwork of the Creator and from His activities since Creation. The other information source is the very Word of the Creator. As a theologian I wrestle with the union of God and man in the God-Man, Christ Jesus. I test my understanding of that relationship by the Biblical evidence, revising my conclusion as I discover that it does not accurately account for all of the revelation on the subject. As a geologist I attempt to understand earth's great orogenesis in the light of the physical evidence found in the very real physical, geological column as it exists in the field. But, at the same time, I evaluate my tentative conclusions in the light of my ever growing knowledge of the final authority, the Word of the Creator. Often I find I must revise my conclusions to harmonize with the facts.

THE MECHANISMS FOR MOUNTAIN BUILDING FROM A CREATIONIST PERSPECTIVE ARE NOT YET UNDERSTOOD

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Abstract

For this symposium the writer and others were asked to prepare papers concerning orogenesis—the process of mountain making. Then each writer was to read other papers and question the papers' authors in accordance with the questioner's scientific background. Since the writer is a geologist, questions to authors are principally geological in nature.

Preface

No model for orogenesis has yet been proposed which satisfies every part of the scientific community. That is because each scientist views the world from a differing scientific frame of reference. To a geologist, any model proposed concerning development of mountains should explain why mountain making occurred where mountains exist currently. Also the model should explain current differing geomorphic configurations of mountain ranges within any extensive part of a continent. Further, the orogenic model should explain why sedimentary strata and fossiliferous horizons vary from region to region, from country to country and from continent to continent. Also, where possible, the orogenic model should explain which strata are pre-orogenic and which are post-orogenic, and why. The model must explain the existence (or absence) of fault systems.

It is the writer's opinion that the ruling elite of 19th century western Europe were led astray principally by

scientifically deficient, often anti-Biblical forces. A late 19th century result was intellectual acceptance of the myth of evolution based on what was believed to be the fact of geologic time. A mythical corollary was intellectual acceptance of geologic time based on the presumed fact of evolution. Thus any creationist model should include, where applicable, some explanation as to how the elite of the 19th century strayed into a scientific cul de sac to reside there to this day.

Because the writer does not propose an orogenic model, this should not be taken as a reluctance to propose. There is no question that mountain building relates directly to volcanic activity. The mechanism which allowed for such volcanic activity has not been determined, in the writer's opinion, plate tectonics to the contrary notwithstanding.

Because no scientist is omniscient, it is mandatory that scientists from one discipline read the proposals of those from other disciplines. Fresh ideas thrown into the caldron of scientific scrutiny will either spice the theoretical stew or cause the stew to be unpalatable. Criticism of a model is as important as is the model proposed.

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