this way are making a mistake which is so obvious that nobody seems to see it. It is this. The number of deaths occuring now represents on the average a much smaller generation, born some sixty or seventy years ago. If current births do no more than replace current deaths it means that they will be quite incapable of replacing the present younger and middle-aged generations, which are far more numerous.

Answering the question whether births are sufficient to replace the parental generation involves a certain amount of mathematics into which I cannot go now. But I will give you the results, which are alarming. In the whole of New Zealand the number of births now falls short of replacement requirements by 10% or more; the worst figure being that of Germany, miserable in the midst of its riches, 30% short of replacement requirements.

Let me add a very significant point. In Soviet Russia the number of births is *above* replacement requirements. It is true that urban European Russia is very similar to Western Europe, with low reproductivity and high divorce rates; but Russia has a large rural population, which is much more than replacing itself, particularly the Moslem populations of the Central Asian Republics.

But we must have the faith and hope to believe that our civilization, unlike the others of Toynbee's 23 civilizations, is capable of recovery, because it is based on true faith, slow and difficult though the recovery may be . . .

The decline of population is a central element in the decline of a civilization. Ours is the only civilization built on Christian faith, and it may yet prove capable of resurrection . . .

HOW THE FLOOD ALTERED THE EARTH

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Based on a new interpretation of the Biblical Fountains of the great Deep, this paper presents a new theory of the construction of the earth's original crust and the changes that have been wrought in it. It is proposed that in the beginning, a layer of water separated two layers of crust. That layer of water was the Deep. The ocean basin floated on that water, supplying the pressure to operate the fountains. To initiate the Flood, God personally produced the deep-sea trenches and the crevice in the crust down the middle of the mid-ocean ridge, in order to force the waters of the Deep to the surface.

Introduction

The Theory of Continental Drift, or Plate Tectonics as it is also called, seems to have won the allegiance of the majority of the scientific community. While lip service is given to its being a theory—

> "This theoretical insight, which goes by the term "plate tectonics,"[1]

it is obviously being believed as fact,

> "While few earth scientists agree on details, the broad outlines of plate tectonics are established beyond dispute."[2]

The broad outline of the theory is stated thus:

> "Here," (the Mid-Atlantic Ridge) "according to the revolutionary new theory called plate tectonics, huge rafts of crust diverge, carrying the American Continents away from Europe and Africa at about an inch a year. Where plates converge, they form deep ocean trenches as one edge slips beneath the other to be reabsorbed into the earth."[3]

Although it doesn't shake the faith of the believers that no one can propose a believable mechanism that could produce the stated effects, writers on the subject feel it necessary to point out that lack, as the following quotations indicate.

> "This uplifting, from processes unknown, may be the primary agent building the Mid-Atlantic Ridge."[4]
>
> "Driven by implacable and still not-altogether-comprehensible forces, these plates move off around the world . . . "[5]
>
> "The motion of the ocean floor is driven by thermal convection in the mantle. This motion provides the visible half of a convection loop . . . The details of the return flow are poorly understood and are therefore the subject of continuing investigation."[6]

Calder summed up the proponents' views when he wrote,

> "Although no one knows exactly how the plates of the earth's shell are driven around, that does not deny their movements."[7]

One wonders, would not the opposite conclusion to Calder's be the more logical one? If none of the brilliant scientific minds that have worked on this problem for years can come to a conclusion as to exactly how the plates of the earth could be driven around, perhaps they never have moved.

The Theory of Plate Tectonics is based on the Uniformitarian principle, i.e., the belief that present processes operating over eons of time, without plan or intervention by a Higher Power, have produced all that we observe today. Heezen emphasized the importance of this doctrine when he wrote,

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"Geologists love this guiding principle of uniformitarianism."[8]

The Biblical Creationist, however, has another guiding principle, which could be called, "The Divine Intervention Principle." God, the Creator according to His own plan, made all things "very good". He established the present processes that maintain His creation. From time to time He directly intervenes to make some change, according to His will and purpose, after which the present processes resume operation.

The new ideas now to be presented are based on a new explanation of the "fountains of the great Deep", and, propose that God brought on the Flood when He personally broke up the fountains of the great Deep, unleashing natural forces, which then resculptured the face of the earth.

These ideas suggest answers to such questions as these: why is the Mid-Atlantic Ridge in the middle of the ocean; why are similar fossils found on opposite sides of the Atlantic; and how were the mountains formed?

Fountains

> "For (in) six days Jehovah made the heavens and the earth, the sea, and all which (is) in them" (Exodus 20:11)[9]
>
> "Worship Him having made the heaven and the earth and the sea and the fountains of waters." (Revelation 14:7)

Both the first and the last writers of Scripture tells us that the Creator made the heavens and the earth and the sea. Moses then includes every created thing by adding, "and all which (is) in them". John, however, only adds, "fountains of waters", which is just one of the "all" which is in the earth. What are these "fountains" that are singled out for such special mention?

The Genesis account of creation lists two types of fountains of waters:

> "and a river went out of Eden," (2:10) and "a mist went up from the earth." (2:6)

As "Jehovah God had not rained upon the earth" (2:5), Eden's river could not have had its source in rain water. Instead, there had to be a large "pipe" going from the surface down through the earth to a pressurized water reservoir. The other type of fountain sprayed a mist, i.e. liquid water in fine drops,[10] into the air. To accomplish this another "pipe" had to go up through the earth from the pressurized subterranean water supply to the surface where it was capped by a nozzle which produced a mist.

"Subterranean water supply" is one of the definitions of the Hebrew word which is translated "Deep". As the two types of fountains just described had as their source an underground water supply, they then are what Scripture calls, "fountains of the Deep". Solomon mentioned these fountains when he wrote about Jehovah at creation, "making strong the fountains of the Deep". (Proverbs 8:28) The fountains had to be strong. The "pipes" coming up from the Deep had to be waterproof, so that leakage would not cut down on the amount reaching the surface; they had to be wear proof, so that as the years went by the moving water would not wear them thin so they would rupture; and they had to be pressure proof, so they would not break under the tremendous pressure there had to be on the waters of the Deep.

Purpose of the Fountains

Each type of fountain had its own purpose which is specifically stated in Genesis. Of the fountain supplying the river it is written:

"And a river went out of Eden to water the garden." (2:10) The significance of this statement has escaped notice and it bears repeating. The purpose of the river was, "to water the garden". Every bit of vegetation, from the grasses to the trees, had its total water needs supplied by the river. How was this tremendous task accomplished?

An answer to this question is found in a recent article in the Popular Science Magazine which details a method of raising vegetables indoors. A layer of pea gravel is put in the bottom of a watertight container. On top of that is placed a layer of a growing medium, which in this case is ground pine bark mixed with various nutrients.

> "The whole system works by maintaining a constant water table at a point where the gravel and bark meet."
>
> "There is no need to water from above at any time, since water will move up through the pine bark by capillary action."[11]

From this, a suggestion can be made as to how God structured the original land mass. On top of the bedrock he placed up to several thousand feet (depending on the elevation desired) of all manner of soils and minerals. Most of this material is what formed the sedimentary rock. Then to keep those soils dry he covered them with a layer of watertight material. Next, was a layer of "pea gravel". Covering that was His growing medium. The "pea gravel" layer ran into the river and the elevation of the land mass in relation to the elevation of the river was such as to maintain the proper water table. There was no need to water the garden from above for the water moved up through the growing medium by capillary action.

The Genesis account only speaks of one river which was to water the area of the Garden of Eden. (2:10). As the ban on rain was world-wide (2:5) it is logical to believe that the whole earth was watered by the same system as was Eden. Many, many thousands of fountains, therefore, had to be strategically positioned all over the land area in order to supply rivers, whose purpose was to water the earth.[12]

Genesis also specified the purpose of the second type of fountain.

> "And a mist went up from the earth and watered the whole face of the ground." (2:6)

It was previously stated that there was no need to water the garden (or any part of the earth for that matter) from above. What then was the purpose of spraying a mist into the air? The answer to that question is given in the Popular Science Magazine article previously quoted. After telling about the water moving "up through the pine bark by capillary action", it goes on to say,

"The surface of the bark will remain dry, but the

bark immediately below will be moist."[11]

The purpose of the mist, then, was to keep the surface of the ground moist so it would not dry out and form a hard crust. This is what Genesis 2:6 tells us when it says that the mist "watered the whole face of the ground". The face of anything is just the surface and therefore only the surface of the ground was watered by the mist.

The design, operation, and placement of the mist fountains is not revealed to us. The following description, therefore, is just a suggestion of how they might have been.

As the "pipes" for the mist fountains neared the surface, they entered a rock and went through it to the top which was 10-15 feet above the ground. Near the end were shut-off valves. The construction and operation of the valves is a mystery but they probably were operated by heat. At the warmest part of the day, i.e. mid-afternoon, they snapped open due to expansion. As the water flowed through the rock it gradually cooled it down so that when the desired amount of water had been sprayed the valves snapped shut. The ends of the "pipes" were capped by a nozzle or series of nozzles that sprayed a fan shaped pattern which was perpendicular to the direction of the "breeze of the day". (Genesis 3:8)[13]

This "breeze of the day" occurred at mid-afternoon, at the same time that the valves opened. Thus the spray was spread by the breeze over a wide area.

The number of mist fountains would depend on how far the breeze carried the spray before it fell to the ground and how wide a pattern the fountains sprayed. if, for instance, the area covered was 100 thousand square feet per fountain, it would have taken 2.78×10^{10} number of fountains to water "the whole face of the ground."

Pressure on the Deep

Tremendous pressure on the Deep was needed to force upward the water that supplied perhaps as many as 200 thousand river fountains plus the almost innumerable mist fountains. What supplied that pressure?

To enable us to answer that question we will first ask a second question, which is, how was the pre-Flood sea level kept constant?

The fountains of the great Deep were "broken up" at the beginning of the Flood. (Genesis 7:11) During the 1656 years from creation until then, however, they had poured out more than 26 million cubic miles of water that was new to the surface, which was enough to cover the land area to a depth of over 1380 feet.[14] All this water, of course, ended up in the ocean which should have raised the sea level and flooded over much of the land area. Such a situation would not have been "very good" (Genesis 1:31) and therefore God had to have provided a way to keep the sea level constant. The following description is a suggestion as to how He accomplished it.

The crust of the earth was made in two sections. The thickest portion, which we will call the lower crust, rested on the mantle. Covering the lower crust was a layer of water. A thinner section of crust which we will call the upper crust, rested on the water. The upper crust was divided into two sections, the land and the ocean basin. Under the land area spacers went from the lower crust, up through the water to the upper crust, to prevent it from sinking. The ocean basin crust rested freely on the water and thus supplied the pressure that operated the "fountains of the great Deep". As water was continually being forced to the surface, the ocean basin was continually sinking. Water, however, was continually being added to the ocean and thus sea-level was kept constant.

We have just described a globe-encircling subterranean water supply, i.e., a Deep. Surely it deserves to be called what the Bible called it, a "great" Deep. (Genesis 7:11)

How Much Water in the Deep?

The present amount of surface water has been estimated at 350 million cubic miles. The amount of underground water is, of course, unknown, but is undoubtedly very small in comparison to the surface water. All this water, I believe, is the water that surrounded the earth after God's first day of creative activity. (Genesis 1:2) Using the 350 million cubic mile figure as a reasonable estimate, the earth was then covered with water to a depth of 1.75 miles or 9240 feet. This amount was divided between three locations; the Canopy, the sea, and the Deep. An amount of 420 feet has been suggested for the canopy.[15] As the sea depth would be deepening constantly, it is likely that the original depth was relatively shallow and I suggest an average depth of 2000 feet. This amount would be enough to cover the entire earth to a depth of 1000 feet.[16] The remaining 7820 feet were put into the Deep.

The Flood

> "And behold, I, even I, am bringing a flood of waters on the earth." (Genesis 6:17)
>
> "And God said to Noah, the end of all flesh has come before me, for the earth is filled with violence through them. And, behold, I will destroy them along with the earth." (Genesis 6:13)

There would not have been a flood if God had not personally intervened to cause it. The universe had been made "very good", and surely that meant that the earth's crust was seamless, solid, and strong. The outward pressure of the earth's hot interior was counterbalanced by the weight of the crust. The pressure would never crack the crust and the crust would never sag inward and thus be cracked. Only the Creator who had made all things "very good" could change things to "not so good".

When God did bring on the flood, it not only destroyed man and animal, but as Genesis tells us, the earth. The magnitude of that destruction and the tremendous movements, sinkings, and uplifts of the earth's crust that took place are almost beyond comprehension.

Estimates of the volume of sedimentary rock, all of which was brought into existence by the flood,[17] are upward from 50 million cubic miles. That much would cover 100 million square miles to a depth of 2640 feet. The original land mass must have had elevations of 5000 feet or more to average 2640 feet, all of which had

to be completely eroded away, mixed, sorted, and deposited to form today's sedimentary rock. Violent upheavals and sinkings of the earth's crust then occurred in order for us to find sedimentary rock on top of the high mountains as well as miles below sea level.

THE OCEAN BASINS

The Pacific

A most unique feature of the Pacific Ocean basin is its deep-sea trenches.

> "A nearly continuous garland of long, narrow, deep-sea trenches sharply separates the arcs of active volcanos and the deforming coastal ranges of Asia and America from the stable ocean basin floor which lies beyond. This narrow transition zone, this unstable continental margin, which includes the Indonesian arcs of Southeast Asia, nearly rings the Pacific basin. The greatest depths of the sea are found here in steep-sided narrow gashes which characteristically cut almost precisely ten kilometers into the earth's crust."[18]

The Atlantic

The Atlantic Ocean basin's spectacular feature is its 12,000 mile long Mid-Atlantic Ridge or Rise, the planet's largest mountain range.

> "It closely duplicates the curves of the coasts far east and west of it."
>
> "Along vast stretches of the rise, the summit is slotted by a great rift valley, gouged out like a groove."
>
> "It is quite as if this rift in the mountain chain were atop a crack in the ocean floor crust, through which heat seeps from the hot mantle substance below."
>
> "Precise soundings by means of waterborne sound waves have shown that the so-called rift valley, where it runs along the summit of the Mid-Atlantic Rise, is about 2 km. deep and up to 50 km. in width."
>
> "On either side of this strange central split lie the peaks of the main range, and farther out along the slopes are the lesser peaks."
>
> "However, the ridges and their central rifts are repeatedly offset by great faults or fracture lines, running very nearly at right angles to the ridge line at that point. Such great ridge fractures may be traced as far as 100 km. or more from the ridge summits."[19]

In 1974 the American submarine Alvin made many dives into the Mid-Atlantic Ridge rift valley at a spot near the Azores and observed that,

> "The presence of molten lava close beneath the floor of the median valley was indicated by a variety of formations indicating that lava bubbles up, particularly along the valley centerline."
>
> "It was evident . . . that current volcanic eruptions are largely—if not entirely—confined to a zone within some 500 feet to either side of the valley centerline."[20]

This 1000 foot wide band down the center of the valley must be the crack in the ocean floor crust mentioned in a previous quotation, through which heat is released upwards.

The Indian—Pacific

The Indian Ocean basin also has its noteworthy features.

> "Besides the great Mid-Atlantic Rise, running from Iceland to 40° or more S latitude there are related ridge systems curving eastward around the southern tip of Africa, then running northward all the way through the Indian Ocean into the torrid Gulf of Aden, nearly 15° N of the equator."
>
> "Similar rifted ridges run along the floor of the Indian Ocean and midway between the continents of Australia and Antartica. Another ridge curves along the floor of the eastern Pacific Ocean in a generally northward direction. Each of these mid-ocean ridges runs very nearly halfway between the limits of the ocean on whose bottom it is found."
>
> "This truly worldwide network of oceanic rises has been said to loop around the earth like the seams on a baseball. Its combined length is about 40,000 km. (25,000 mi.), roughly long enough to encircle the entire earth at the equator."[21]

There are two other features common to all the ocean basins which we will just mention.

> "Thousands of bountiful volcanic vents have poured out sufficient lava from the earth's mantle to build the massive underpinnings of oceanic islands, coral atolls, and seamounts. However, millions of abyssal hills, knolls, and peaks have been produced by other less ample vents which failed to produce enough to build to the surface of the sea before their activity was snuffed out."[22]

The second feature is the micro-continents.

> "There is however, another class of fundamental features which lie slightly submerged beneath the oceans . . . These are the micro-continents. Small in size in comparison with the proverbial seven, and mostly covered by the sea, they constitute an enigmatic phenomenon."[23]

The Continents

Several continental features owe their existence to special cracks or vents in the earth's crust. Most of the volcanic activity has occurred in the ocean basins but there are a few volcanic vents scattered around the continents. Then there are the faults such as the famous San Andreas fault in California. Not only are there rift valleys below sea level but also some on land, such as in East Africa. Then there are spots on the continents like the Anadarko Basin in western Oklahoma. Deep wells have been drilled over 36,000 feet down in sedimentary rock, and wells as deep as 50,000 feet are predicted. Bob Hefner, whose company is drilling these deep wells said,

> "But this basin has 22,000 cubic miles of sediments below 15,000 feet."[24]

Imagine the forces that cracked the crust to form a column, maybe 30 km. or more from surface to the

mantle, which then sank into the mantle up to 10 miles, leaving a surface hole just as deep, which then was filled with sediment.

Comments

The authors quoted above were impressed when they contemplated the worldwide systems of trenches and rises, calling certain features "strange", and likening the placement of the trenches to a "garland" and of the rises to the "seams on a baseball": words denoting order. I, too, am impressed as I look at a map[25] of these things and contemplate the magnitude of the things it represents. It all looks so orderly, as if designed for some particular purpose.

Creationists have often pointed out that the order comes from intelligence and that a design comes from a designer. I believe that this tremendous system of trenches and rises, as well as the volcanic peaks, and all other crustal deformities, whether in the sea or on land, is the personal work of the Creator when He unleashed the waters of the Deep in order to remake the face of the earth according to His plan.

One Half Land

Every theory has its suppositions and the ideas presented here are no exception. The main supposition of these ideas is that God personally produced the changes in the earth's crust which no natural force was capable of doing. A second supposition is that originally, in addition to the present land mass, the area now occupied by the Atlantic Ocean was also land. God, knowing that some day an ocean would occupy the area, had constructed it to be easily eroded. If the micro-continents had also originally supported land masses, then the amount of land area that had been created would have been approximately fifty per-cent of the earth's surface.

The compelling reason, to me, for having that much land, is the present amount of sedimentary rock, the volume of which, as mentioned earlier, is estimated upwards from 50 million cubic miles. The sediments for that rock had to be eroded from the land. One hundred million square miles (approximately one-half the earth's surface) would have needed an average elevation of 2,640 feet. If the land area had only been today's approximately 60 million square miles, the average elevation of erodable material would have needed to be 4,400 feet. That seems, to me, to be too high.

Broken Fountains

> ". . . in this day all the fountains of the great deep were broken up, and the windows of heaven were opened up." (Genesis 7:11)

The breaking up of the fountains of the Deep, those fountains that had been made strong at creation (Proverbs 8:28), was a tremendous undertaking. It was no haphazard event, but was perfectly planned and designed to accomplish God's purpose. One of the reasons for the flood was to destroy the earth (Genesis 6:10). Out of that destruction, however, had to come another earth, suitable for human habitation. Thus, the destruction process was also a construction process.

Two main factors determined how the earth was reconstructed. The first was the way God had constructed the first earth; i.e., the location and extent of the various types of vegetation (forest and meadows, etc.) and the location and extent of the soils and minerals that made up the land mass. The second factor was the way in which God broke up the earth's crust; i.e. the location and size of the openings that let out the waters of the Deep. These are the things that determined that America has so much coal and the Middle East has so much oil, and the location and extent of all the earth's natural resources.

The Break-Up

During the Flood, a problem that needed to be solved, was how to keep the sediments over the land area. The eroding waters that fell from the Canopy for 960 consecutive hours, rushed towards the sea, carrying their load of sediments. Those sediments were the building materials needed to rebuild the land mass and therefore counter currents were needed to move the sediments back.

Now let us consider just what God did when He broke up the fountains of the Deep. He crushed a 1,000 foot wide, 25,000 mile long, and a 3 mile thick (the thickness of the upper crust) band in the upper crust down the center of what would be the Mid-Ocean Rise; He made all the faults or fracture lines which are perpendicular to the Mid-Ocean Rise; He crushed the rock which was in what are now called the deep-sea trenches; He poked, as with an oversized ice pick, millions of holes through the 3-mile thick ocean floor which became the vents over which seamounts, etc. were built; He also poked some holes in the continental upper crust; He cracked the upper crust making the fault lines we observe today; He cracked the continental crust in millions of places and ways so that sinkings such as the rift valleys and the Anadarko Basin in Oklahoma would take place, and to allow mountains to be raised; He made vents and trenches in the lower crust to allow lava to rise to the surface; and more.

It took just a moment for God to finish His work and then natural forces took over. The crushed, and maybe pulverized rock,[26] started dropping into the Deep and water was forced up through the cracks. It very likely took some days for the 3-mile thickness of crushed rock to fall into the Deep and perhaps towards the end be washed out the top. When the trenches were clear the waters of the Deep were forced to the surface with great power.

The moving wall of water, especially as the flood waters deepened, produced two circulating currents, one on either side, with the water moving towards the middle on the bottom and away from the middle on the surface.

In the Atlantic area these two currents literally melted away the soils, thus producing the ocean basin. The currents extended out equal distances from the middle which explains the central location of the Mid-Atlantic Ridge. The sediments, and vegetable and animal material, were moved out over the continents,

which is the reason similar fossils are found on opposite sides of the ocean.

The currents set up along the rest of the mid-ocean ridge system, swept the ocean bottoms, and moved the sea creatures over the land.

The deep-sea trenches are located next to land so one of the currents set up by them served to help erode the land areas and keep the sediments on the land.

One of the sources of power that produced all these currents was the total weight of the upper crust. The ocean bottom had always rested on the waters of the Deep and the weight of the land areas was added when God faulted and fractured it in innumerable places.

The Lower Crust

The vents and trenches God made in the lower crust allowed lava from the mantle to flow in copious amounts into the Deep, helping to force the water to the surface. It took 150 days (Genesis 7:24) to force out the waters of the Deep and allow the rising lava to meet the sinking crust, at which time the fountains of the Deep were stopped. (Genesis 8:2) That wonderful, fantastic, underground watering system was no more. It had been completely destroyed.

Stopping the fountains did not stop the lava. Pressure from the mantle forced lava up the three mile thick mid-ocean trench. The pressure of the water above counterbalanced it there. In the deep sea trenches, however, lava did not rise very high. The reason for that may be that the openings in the lower crust, through which lava was rising, were some distance away, while the mid-ocean trench was near to the openings in the lower crust.

Lava was forced up the millions of ocean floor vents and built everything from little mounds, to great sea mounts, to islands, and mountain ranges before the flow was shut off. All this sub-marine mountain building took place between days 150 and 223 of the flood year. (Genesis 8:5)

Sinking Oceans, Rising Mountains

Tens of millions of cubic miles of mantle material became part of the crust below the oceans. This caused a slight lessening of mantle pressure, which, coupled with the increased weight of the crust, allowed the ocean bottom to start sinking. Water from the continents immediately started pouring into the oceans, adding more impetus to the sinking. Before mantle pressure built up enough to stop the crust, it had sunk an average of perhaps up to 2 miles or so.

The increased mantle pressure was reflected under the continents by forcing more lava into the old Deep, where, acting like a hydraulic jack, it tilted some land areas, raised up plateaus, and pushed up mountains.

Odds and Ends

1. The lava, which replaced the water in the Deep, trapped large pools of water under pressure up against the bottom of the upper crust. These pools are the source of the water being forced out of vents in the ocean floor.[27]

2. While forcing the water out of the Deep, the lava incorporated in itself a great quantity of it. This is the source of the water released into the air during a volcanic eruption.

3. "The mid-ocean ridges . . . take up a lot of room under water. If all the present mid-ocean ridges vanished, the sea level would drop by well over 1,000 feet."[28]

That 1,000 feet represents over 25 million cubic miles of lava that helped push up the rise and now maintains it. The pressure, first of water and then of lava, was able to raise the curved edge of the ridges because of the faults God made in the crust, perpendicular to the ridge. I suggest He needed all those extra millions of cubic miles of lava in the crust to make the crust heavy, so the ocean basins would sink.

4. This paper has proposed that the original crust of the earth was in two sections, upper and lower, which were separated by the Deep, which was a layer of water. During the Flood, this water was replaced by molten lava. The thickness of the Deep became varied during the Flood due to sinkings and uplifts of the upper crust. It is to be expected that most of the lava has cooled and hardened. Some areas, however, would remain fluid due to their being over the larger vents in the lower crust. As the lava is mantle material, which is denser than the crust, there would be a discernable boundary between it and the upper crust, the same as between the mantle and the lower crust.

Is there any evidence for these things?

The literature does not use my terms of upper and lower crust, but it does recognize, due to seismic wave analysis, that the crust is in layers. Under the oceans, we are told, the crust is typically 3 miles thick. This, however, rests on another layer, which Calder calls the "plate", which may be up to 40 miles thick.[29] This plate he says rests on a layer of a mixture of solid and molten rock, which rests on the mantle.

Scattered around the globe are about 20 areas, about 400-500 km. in diameter, called "hot spots", because they have a higher than average heat flow at the surface.[30] These areas, then, must be over the pools of fluid lava which are over the large vents in the lower crust.

5. On May 25, 1980, a series of earthquakes, registering around 6 on the Richter scale, rocked the Mammoth Lakes area of California, which is located just southeast of Yosemite National Park. The reports stated that the scientists were looking for the fault line that produced them.

If the ideas proposed in this paper are correct, then earthquakes can occur at places other than at fault lines. It was suggested, that when lava rose up through the lower crust into the old Deep, that in some areas it acted as a hydraulic jack and pushed up mountains. If that big pool of molten lava hardened, then the area would be stable. If, however, that lava remained fluid, then, due to shifting forces within the earth, some lava could drain out or new lava could be added. In either case the area could shift, adjusting to the new pressures, which would cause earthquakes. This mechanism could, of course, produce earthquakes along fault lines just as well as elsewhere.

Conclusion

The deep seas give up their secrets reluctantly. The area to be examined is vast, and obtaining first hand information of the depths is difficult. Instruments at, or near sea level tell some things; cameras and dredges lowered in the depths bring back a bit of information; and a few deep sea dives in submersibles have increased our knowledge. Yet, many questions remain unanswered.

It may be, that as more knowledge is obtained, some ideas expressed in this paper will need revision. Nevertheless, the author hopes that what has been said may be a springboard for developing a global model that will conform to Scripture and its time-table, as well as to the facts of God's Creation.

Appendix

Some of the ideas presented in this paper are the outgrowth of the conviction that not only have the crustal plates of the earth not moved, as predicted by the Theory of Plate Tectonics, but that it is impossible for them to do so. In this appendix we will examine some of the evidences that led to that belief.

A powerful argument, to me, against plate movement, has already been mentioned but bears repeating.

> ". . . no one knows exactly how the plates of the earth's shell are driven around . . . "[7]

Yet, much is written about convection currents as being the driving force. Diagrams are drawn, as in figure 1a, supposedly showing crustal plates that are just the width of the convection currents. The theory calls for one plate to grow in width while its adjacent plate diminishes in width. Under that situation, if the convection currents remained the same width, as in 1b, the movement of the plates would have to slow down and eventually stop, as two opposing currents would be acting on the same plate. Thus, to keep the system working, the width of the convection currents would have to change at the same rate as the plates (lc).

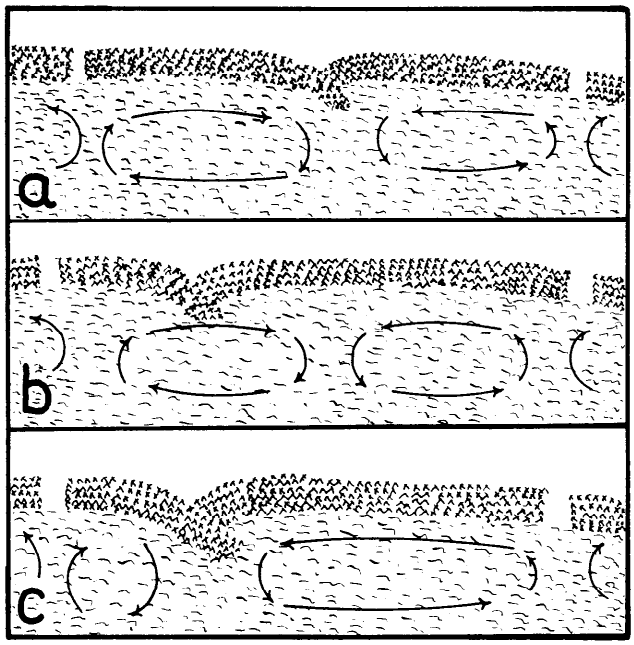

Figure 1. Convection currents, indicated by the arrows, are supposed to move the crustal plates above them, as in part a. However, if the convection currents remained the same, in time the plate would come to a place where adjacent and opposite currents were acting on it, as in part b; and it would remain there. The only way to get the notion to work would seem to be to have the convection currents shift along with the plates, as suggested in part c. But there seems to be no reason why they should do so.

Klein makes an interesting observation.

> "newly formed crust moves outward from the mid-ocean rise . . . The process is the result, *not the cause*, of the great convective cycles taking place below in the asthenosphere . . ."[31] (emphasis added)

Herein I see an impossibility. The result—moving plates—have to control the cause—convection currents—or the plate movement will stop.

Subduction

The crust of the earth is not divided up in even squares, but in plates of irregular size and shape. The Theory of Plate Tectonics calls for certain edges of certain ocean basin plates to be continually rolled under with the leading edge constantly being melted in the mantle, the supposed process being called subduction. This appears to me to be an impossibility. The plates are not made of rubber, to so be bent, but of solid, rigid rock up to 40 miles thick, that certainly will crack and break off rather than bend. Therein lies another objection. There is no natural force from above which could push on the edge of the plates and bend it. Neither is there a force below that could pull or suck the edge down. Then how could it happen? Menard believes he has a solution and writes authoritatively:

> "Trench is created where the leading edge of a plate that emerges from a fast spreading center collides with another plate. Because the combined speed of the two is more than six centimeters per year, neither can absorb the impact by buckling. Instead one crustal plate plunges under the other to be destroyed in the asthenosphere."[32]

The logic of all this escapes me. A speed of six centimeters a year does not seem to be enough to cause any damage in a collision. The opposing plates should just stop, and if the driving force continued, the plates should just be in a shoving match. Also, the words "collision", and "plunge", can hardly be associated with a speed of six centimeters per year.

Another objection is that there never could be a collision. That word implies an original separation of two objects which then come together with force. Two plates of the earth's crust, however, never can have an empty gap between them. Calder explains:

> "No gap can exist between the plates—there are no forty-mile deep chasms in the earth's surface. One plate can ease itself away from another but in that case hot rock instantly rises from below to fill the incipient gap."[33]

No gap, no collision; no collision, no plunge; no plunge, no subduction; no subduction, no continental drift. That is the way I see it.

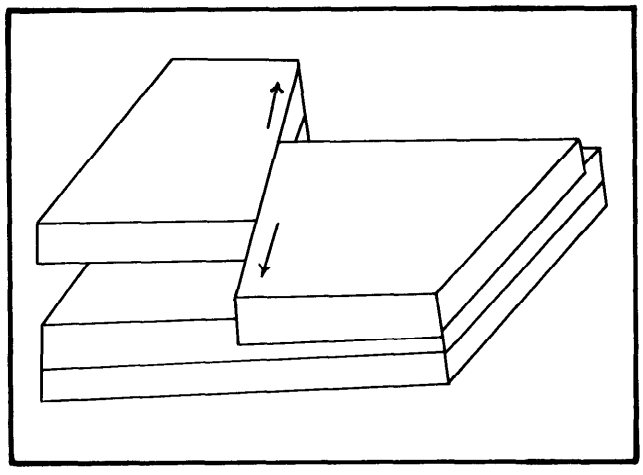

Figure 2. This shows how transverse faults are commonly envisaged in connection with the plates. This view is criticized in the text, as overly simplified.

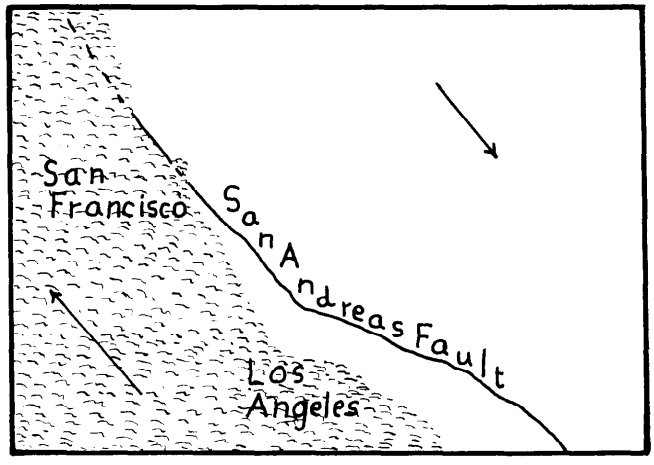

Figure 3. This shows how the two sides of the San Andreas fault are moving. The sliding is not along one straight line; so complications, as discussed in the text, would arise if the crust moved any great distance in that way.

Transverse Faults

Figure 2 is similar to the book illustration[33] of the operation of transverse faults. I have two objections to this model.

First, actual faults in the earth's crust are not straight lines. Figure 3 shows the line of the San Andreas Fault[34], which, as it goes through California, is a transverse fault.

For the two plates to move as indicated, they will have to cam themselves apart leaving a gap between them, which would then fill up with lava. In the supposed millions of years of movement, similar situations must have arisen many times. The fault line, therefore, should be a wide band of hardened lava—but it is not.

The second objection to figure 2 is that the topography of actual fault lines is not flat. The fault runs up and over hills and down through valleys. If the supposed movement had occurred, there should be no conformity of elevation of the two sides of the fault line, except where one side going up met the other side coming down. Also, sheer high cliffs on one side of the fault line should be next to low valleys on the other side of the fault line. These conditions do not exist. My conclusion is that the plates have not been moving for millions of years as is claimed.

Comments

The two theories of Evolution and Plate Tectonics have two big points in common. They both need millions and billions of years to accomplish their objectives, and neither one can find a satisfactory mechanism to make their systems work. Calder laments:

> "The plates and their interactions constitute a fine piece of machinery that explains the outward appearance of the planet. It is exasperating not to be sure how the machinery works."[35]

Allow me to make a few personal observations. The above quotation brings to mind Paul's comment about some in the last days who are "always learning and never being able to come to a full knowledge of truth." (II Timothy 3:7)

How can they find mechanisms for supposed processes that take supposed millions of years when the universe is only a few thousands of years old? How much more profitable their research would be if they could at least consider the possibility of a Creator, Who not only created the universe, but, when He considers it necessary to fulfill His purpose, makes an adjustment to His creation. The biggest adjustment He made was when He initiated the Flood.

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[2]*Ibid.*, p. 39.
[3]Heirtzler, J.R., 1975. Project Famous—Man's first voyages down to the Mid-Atlantic Ridge. *National Geographic Magazine*, 147(5): 586-603. See especially p. 588.
[4]*Ibid.*, p. 603.
[5]Alexander, Tom, 1975. Plate tectonics has a lot to tell us about the present and future Earth. *Smithsonian Magazine*, 5(11): 38-47. See especially p. 39.
[6]Sclater, John G., and Christopher Tapscott, 1979. The history of the Atlantic. *Scientific American*, 240(6): 156-174. See especially pp. 159 & 160.
[7]Calder, Nigel, 1972. The restless earth, The Viking Press, New York, p. 108.
[8]Heezen, Bruce C. and Charles D. Hollister, 1971. The face of the deep, Oxford University Press, New York, London, & Toronto, p. 591.
[9]Green, Jay, 1976. The Interlinear Hebrew/Greek English Bible, Associated Publishers and Authors, Lafayette, Indiana. All Biblical quotations are from this version.
[10]Either the mist that went up from the earth was liquid water or it was evaporated water. If evaporated water, then it had to condense back to liquid in order to water the ground. (Genesis 2:6) That would be rain which was ruled out. (Genesis 2:5) The mist, therefore, had to be liquid water.
[11]Jones, J. Benton Jr., March 1980. Construct your own automatic growing machine, *Popular Science Magazine*, p. 87.
[12]If the original land area was one-half the earth's surface, i.e. 10^8 square miles, and the vegetation used 8 inches of water a year; if the river fountain's pipes were 20 feet in diameter and the water flowed out at a rate of 1 (one) mile per hour, it would take the total output of

125,000 plus fountains just to water the earth. But there must have been more than that to allow the rivers to carry water all the way to the sea.

[13]Peterson, Everett H., 1980. The necessity of the canopies. *Creation Research Society Quarterly.* 17(4): 201-204, and 213.

[14]If the vegetation used 8 inches of water a year and the mist fountains sprayed 2 inches a year for a total of 10 inches a year, in 1656 years, that would amount to 26 million cubic miles of water, enough to cover 10^8 square miles to a depth of 1380 feet. The amount of water the rivers carried to the sea would add to that amount.

[15]Reference 13, p. 202.

[16]This paper assumes that the original areas of land and sea were equal.

[17]Reference 13, pp. 202 & 203.

[18]Reference 8, pp. 445 and 448.

[19]Klein, H. Arthur, 1972. Oceans and Continents in Motion. J.B. Lippincott Company, Philadelphia and New York, pp. 121, 123, 124.

[20]*San Jose News*, August 16, 1974, from *New York Times Service*, p. 25.

[21]Reference 19, pp. 121, 123, & 124.

[22]Reference 8, p. 493.

[23]*Ibid.*, pp. 521, 522

[24]Hodgson, Bryan, 1978. Natural gas: the search goes on. *National Geographic*, 154(5): 632-651. See especially p. 641.

[25]Reference 8, pp. 550-551 & 596-597.

[26]*Ibid.*, p. 452. "Masses of rubble, talus slopes, fractured, fragmented, pitted and corroded outcrops, all have been photographed on the inner walls" of the trenches. This is what would be expected if the origin of the trenches had been the suggested crushed rock.

[27]1979. Strange world without sun. National Geographic 156(5): 680-683 shows a picture of a plume of water spewing a black cloud of minerals from an ocean floor vent. Rate of water flow unknown. To flow for the approx. 4400 years since the flood at 1 cu. ft./min. an original cube of trapped water only 1322 ft./side was needed. If 10 cu. ft./min., a cube 2849 ft./side was needed.

[28]Reference 7, p. 121.

[29]*Ibid.*, p. 100.

[30]Reference 19, p. 165.

[31]*Ibid.*, p. 125.

[32]Menard, H.W., September 1969. The deep-ocean floor. Reprinted in Oceanography—Readings from *Scientific American*, W.H. Freeman and Company, San Francisco, p. 163.

[33]Calder, Nigel, *op. cit.*, p. 48.

[34]*Ibid.*, p. 58.

[35]Reference 7, p. 106.

PANORAMA OF SCIENCE

Roman Numerals

It is commonly supposed that Roman numerals are a clumsy method of arithmetic. Two authors, however, have pointed out that that is not so; both authors, I believe, working independently.[1,2] For instance, it is relatively easy to do long multiplication with the Roman numerals. Indeed, they have certain advantages; for instance, there is no need to memorize multiplication tables.

It is not clear whether such results were used anciently: whether these recent discoveries are really re-discoveries. There was undoubtedly a tendency, in ancient times, to work with counting-boards, or abaci. It may be that only since paper and pencils have been so readily available has our way of working with pencil and paper been advantageous.

It is worth while to notice such things to dispel any notion that the ancients were ignorant, or stupid. They were nothing of the sort. Thus ancient literature, when it concerns origins in particular, deserves at least our respectful attention.[3]

Maybe, incidentally, some ingenious reader can devise an easy method of long division with Roman numerals.

Onychophora

The onychophera are small, soft-bodied, creeping animals, looking slightly like caterpillars. They are found in various warm places, and are sometimes called *Peripatus*—at least, some of them are.

Onychophora has been viewed as an intermediate between typical annelid worms and the arthropods. Also, fossils found in the middle Cambrian, which are said to look remarkably like the modern onychophora, were said by many evolutionists to be related to the modern animals, and were sometimes proposed as the connecting links.

However, all of this has changed. The onychophora has lost its place as a link. Neither are the fossils now considered to be any particular relation to it. The total structure, and mode of development right from the egg to the adult, are those of an arthropod. The same is true of the leg movements. The placing of them as an intermediate is now seen to have been a mistake.

How many other plants and animals are there which have been placed with great confidence in certain groups and later found not to belong there? And how many more are there whose misplacing is still to be discovered?

Contributed by Mr. Colin Brown

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[3]Watson, David C.C., 1981. Time and ancient records. *Creation Research Society Quarterly* 18(1): 30-39.

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(Continued from page 116)

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[26]Reference 24, p. 5870.

[27]Reference 15, p. 189.

[28]*Ibid.*, p. 374.