### Conclusions

In the light of such conclusions, the self-confident claims by Huxley and others of "the fact of evolution", take on a rather hollow ring. Yet, when we are regaled in the press or over TV and radio concerning evolution, the weakness of the case for it, as revealed by the quotations given above (which are just a few), is never mentioned.

Yet the facts are there for all to see, and indicate that due consideration should be given to alternative ideas; and scientists, who object to this, appear to be more concerned with upholding a particular dogma than seeking for the truth.

## SINKING CONTINENTS

JAMES R. HONEYMAN *

*Mt. Ararat is an extinct volcano, and there are signs that it erupted and built up under water. It seems possible that this happened at the time of the Flood, when the continents were below the sea level. At the present time the crust of the earth is depressed in the areas occupied by the nothern and southern ice caps, as is learned by tracking artificial satellites. The weight of the two ice caps, it is suggested, would cause excessive internal pressure in the earth; and the ocean floors, being thinner than the continents, would rupture and then be uplifted. Displaced ocean water, added to the loads of ice, would cause the continents to sink, further uplifting the ocean floors. Magma from the rifts would heat the oceans, gradually melting the ice caps. Then, when the load of ice was mostly gone, equilibrium was restored.*

### The Problem Related to the Flood

Numerous mechanisms for the Flood have been advanced, but serious questions remain. The proposal offered here is an outline for study, not a conclusive answer. An attempt is made to suggest forces which are capable of producing two well established phenomena: (1) depressed areas of the crust, and (2) the mid-ocean rifts. That the rifts may have been caused by immense loads of ice on land has not previously been proposed, to the writer's knowledge.

Initial investigation of this possibility resulted from the geological study of Mt. Ararat by Burdick.[1] In a personal conversation, he stated that every piece of lava examined anywhere on the mountain had obviously hardened under water. Other indications that it had once been submerged consisted of some sedimentary rock and several examples of pillow lava. Since the peak reaches nearly 17,000 feet elevation and the base is 3,000 to 4,000 feet above sea level, here is powerful evidence that the entire area was at one time below sea level.

Moreover, working with Burdick, Read[2] demonstrated that lava samples from Ararat had only very small vesicles (gas pockets), or none at all. In this characteristic these samples matched lava samples dredged up from very deep water around the Hawaiian Islands. All magma contains gases, mostly steam, which usually expand and leave pockets as the lava hardens.

Apparently under the pressure of a great depth of water, vesicles are not able to form. Burdick and Read concluded that Ararat had erupted and had built up most of its height during the Flood. It is certainly not unusual for volcanoes to develop under water, as there are hundreds located on the ocean floors today.

### Thickness of Crust

From consideration of very simple facts, it is commonly believed the continents are somewhat thicker than the sub-ocean strata. The crust of the earth "floats" on the plastic interior, according to the theory of isostasy. If a log floats on water, the major part is under the surface with only a few inches protruding. If the log is held upright however, several feet may be above water.

Following the analogy, geophysicists assume that the thickness of the continents must be somewhat greater than the under-ocean strata. Since great mountain ranges have no tendency to sink, it is further assumed that extensive "roots" must penetrate deep into the magma to maintain their elevation.

Extensive research by oceanographers using seismic shooting techniques provides measurements for the difference in thickness of the suboceanic crust and the continents. Ewing and Engel[3] report:

> These showed that the undersea crust in both the Atlantic and Pacific is only four to six kilometers thick, compared with the 25-to-40 kilometer thickness of the crust beneath the continents.

Of course, both ocean and continent are underlain by the mantle, which would add some tensile strength to each. The difference in this characteristic probably favors the continents by no more than a factor of two to one.

In *Physical Geology*, by Longwell, Knopf and Flint,[4] the authors state another difference between continents and ocean floors:

> Examination of the rocks that make up the Earth's crust has brought out a highly significant fact. Under the continents, rocks that approximate granite in their composition are predominant. In islands that rise from the floors of the oceans, however, the rocks characteristically have the composition of dark basalt . . . .
>
> Volume for volume, granitic rock is about 10% lighter in weight than basaltic rock. Therefore, an obvious hypothesis is suggested: great blocks in the crust made of low-density rocks, if they are to rest in balance with adjacent blocks that have higher density, must have larger volume and hence will rise to greater height.

A rather simple experiment can be described here, with quite predictable results, which serves to illustrate the proposed theory. The purpose of the experiment is to show, on a small scale, what might happen if great loads of ice accumulated near both poles.

### Simple Experiment Described

An ordinary cardboard globe may be used to represent the crust of the earth. Because the continents are thicker than the ocean floors, it would be desirable to reinforce all

*James R. Honeyman is Chairman of the Board of Directors of the Creation-Science Research Center. His address is 2610 Upper Terrace, La Crescenta, California 91214.

the area of the continents and the continental shelves. To simulate the ice caps, molded rubber cups, backed up by steel plates, might be used. The rubber cups should cover the area which equals the maximum extent of the ice caps. Those areas are as follows:

**Location:** If the maximum extent of the northern ice cap is plotted on a globe, it will inscribe a circle centered on the geomagnetic pole, which is located north of Baffin Bay, between Greenland and Canada, about 11.5° from the north pole. This is not the dip pole, which moves gradually, but the point where the greatest number of magnetic lines of force accumulate. The southern ice cap apparently centered on the southern geomagnetic pole, but there is less evidence about it.

**Extent:** One well known terminal moraine in Pennsylvania is located about 40 miles north of Pittsburgh. This is approximately 2,500 miles south of the geomagnetic pole. If these two points on a globe are used to set a divider and a circle is inscribed about the geomagnetic pole, it will enclose practically all of the areas believed to have been occupied by the Wisconsin ice cap.

Where mountain ranges were located close to this circle, additional areas were glaciated, apparently due to elevation. Most amazing is the fact that the extreme southwestern tip of Alaska, which is outside the circle, was not glaciated, according to geologists. If the glaciers were due only to snowfall, this would be one of the most likely places in the world for ice to have accumulated.

The final step in preparing the globe for the experiment would be to cut a hole, say near the north pole, and to fill the interior with sand, shaking it to fill it completely. The sand would represent the plastic interior of the earth, which tends to yield to large, long-term stress. If the globe with the rubber caps is placed in a hydraulic press and pressure gradually applied, the results are predictable. The globe will rupture probably near the equator. Since brittle materials tend to fail under stress near the middle of the thinnest sections, we would expect the first rupture to be near the middle of an ocean and across the equator.

Here is a fact which provides strong support for the present theory. Approximately one-half of the more than 40,000 miles of mid-ocean rift, is almost precisely centered between the continents. It is centered in the North and South Atlantic Oceans, also between Africa and the Antarctic, and between Australia and the Antarctic. It forms a great Y in the Indian Ocean, apparently under the influence of India and Sumatra on one side, and Africa and the Antarctic on the other two sides. (Engineers learned long ago that heavily loaded beams or large areas which are loaded equally, tend to fail near their center if they are relatively uniform in strength and thickness.)

### Further Evidences of Rupture

The question then may be asked, do the ocean rifts show any other indication that something of this nature may have occurred? The answer is, yes, in several ways. Consider the rupture of the ocean floors. This is a subject seldom mentioned in the voluminous material published about the rifts, but powerful forces are necessary to fracture the crust.

Cook[5] states that the strength of the crust is similar to granite, which has a tensile strength of about 1,000 lbs. per square inch. This indicates that a tensile force of about two billion tons per square mile is required for rupture. In view of the more than 40,000 miles of ocean rifting and the depth of the under-ocean strata, the forces required must have been gigantic.

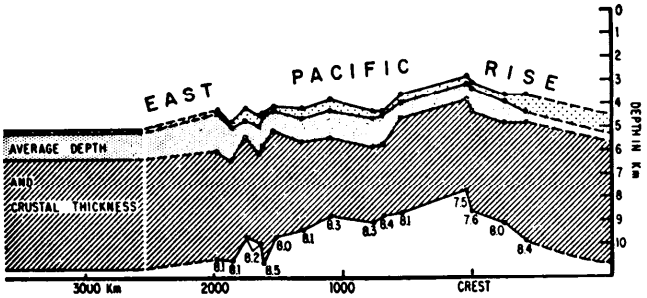


**Figure 1. This shows a cross section of the East Pacific Rise. Note that the vertical and horizontal scales differ greatly. This map is taken from Menard's work, and is used here by permission.**

Cross-sectional maps of the rifts made from seismological studies show the subocean strata are uplifted on both sides of the rifts. A map of the East Pacific Rise prepared by Menard, cited by Cook[6] shows uplift from the abyssal depths commencing about 1,500 miles from the crest on the west side. The eastern slope appears steeper, possibly extending only 600 or 700 miles. The elevation of the crest is on the order of two miles. See Figure 1. This uplift of great areas of the ocean floor, which still exists today, is characteristic of all the mid-ocean rifts.

By far the strongest evidence of extensive uplift is found in the great number of fractures which are perpendicular to the rifts. These constitute one of the major features of the entire system. It is clear that if any substantial section of a globe is uplifted, it must become longer. However, the crust of the earth is not very elastic, so if it is stretched by uplift, it will eventually fracture.

It is not postulated that the ice caps would have done more than initiate the rifts. But two facts should be kept in mind: First, the crust under the ice caps could not have sunken until after rupture occurred. The plastic material under the crust is not very compressible. It could not remove from under any area until there was some place to move; i.e., until the integrity of the crust was compromised. Second, once the first rupture occurred, the stresses would concentrate at both ends, and the rift would propagate very rapidly.

The importance of the uplift of the ocean floors has been emphasized because the next stage then follows. Any uplift would have begun to displace ocean water, which would have had only one place to go-onto the continents. These, of course, were already starting to sink under ice loads in certain areas. The transfer of weight from ocean to continent could have taken place with frightening speed. The movement of water added to the load on the continents. but at the same time it unloaded the ocean floor. The major force which would be capable of creating more than 40,000 miles of rifts and even more miles of perpendicular fracture would be that caused by the continents, sinking under the combined load of water and ice.

Once an equilibrium in nature has been disturbed, it usually goes far beyond a new balance. Then forces begin to act to bring it back to normal. In this case, the magma flowing from- thousands of miles of rifts and fractures would-have begun to heat the oceans. This would have been a heating element beyond comparison. Cook[7] cited evidence from uniformitarian geologists indicating that the ice caps melted in no more than 100 years. Such speed is not surprising in view of the foregoing possibilities.

The fact that continents would tend to rise after being depressed is referred to in this comment in *Physical Geology* :[8]

> Similarly, if the continental mass shown . . . could be forced down until its surface was below sea level, and then released, the familiar Archimedes' principle, or law of bouyancy, would cause slow deformation of the rocks beneath the continent until the surface arose to the proper height for equilibrium.

### A Probable Sequence of Events

It is certainly difficult to assess a probable sequence of events. Here are some of the possibilities:

1. Many believe that the collapse of a water vapor canopy was one of the phenomena associated with the Flood. The collapse might have been initiated by the events which led to the rapid accumulation of ice. Volcanic material ejected into the atmosphere may have provided nuclei of condensation for the precipitation of some of the water vapor.

2. Magma flowing from depth contains great amounts of water in the form of steam. Also, as magma flowed out of the rifts and into the ocean water, vast additional quantities of steam would be generated. All this water, together with that from the canopy, could have caused enormous amounts of rain.

3. When ice began to build up into great ice caps, the first result would be extra pressure on the interior of the earth. Rifting would occur when the pressure caused forces exceeded the tensile strength of the thinnest section, the undersea crust. The area under the ice would have sunken slowly, just as a ship sinks as it is loaded, until a new equilibrium was established. Material displaced by the sinking crust would uplift the ocean floor, causing water to flow onto the continents.

4. The outer limits of the northern ice cap formed a circle about 5,000 miles in diameter. It is possible that the flooding of the continents occurred when the ice cap was no more than 3,000 miles in diameter. The Canadian Shield is nearly devoid of sediments for at least a radius of 1,500 miles from the geomagnetic pole.

If the ice had not advanced more than this, the ocean waters could have deposited sediments which were later modified by moving ice. Some of this growth of the ice caps may well have been due to the precipitation of great amounts of water vapor around the edges of the ice caps.

5. After the ice caps sank until the situation reached equilibrium, the flow of magma from the rifts would have been reduced, but heat stored in the oceans would have continued to melt the ice. The melting however, would require many years. So it could well be that a brief ice age followed the Flood. The ice may have actually advanced for many years after the flooding of the continents.

### Depression of the Crust

Some arguments in this study have been based on the assumption that ice caps existed at one time which were capable of depressing the crust under them. Further evidence for this theory is found in ancient beaches which are far above sea level. It appears that large areas are still rising; so it is proposed that the mass of ice must formerly have been so great that it depressed the crust.

Longwell, Knopf and Flint[9] state:

> Evidence in Glaciated Regions. It is not idle speculation to suggest a force capable of bending a continental mass downward . . . . Emerged shorelines, associated with beach deposits that contain marine shells and bones of dolphins and whales, are found in the region of Lake Champlain and Montreal several hundred feet above present sea level. Similar evidence is found in Scandinavia and Finland . . . . The inference is that the immense loads of glacial ice depressed the lands . . . . Parts of Scandinavia are still rising at the rate of 2 or 3 feet in a century . . . and the Great Lakes region in North America is undergoing measureable tilting by continued uplift in Canada . . . .

Figure 2 shows[10] the amount of uplift which has taken place since the ice melted. It goes from zero at about the middle of Lake Michigan, to 900 feet of uplift at the eastern shore of Hudson Bay.

Studies by O'Keefe during the International Geophysical Year, cited by Wilson,[11] also are interpreted in terms of depression of the crust under both ice caps. These studies of the orbits of satellites show that they change altitude according to the gravity of the earth beneath them. The tracking of satellites is so precise that very small variations in gravity can be detected. Wilson's comment was that the earth was found to be slightly "pearshaped":

> For the earth to depart from a spheroidal shape it must have been pressed inwards in Antarctica and in a ring through Europe, Siberia and Canada; these are precisely the places where great loads of glacial ice were placed on the earth during the recent ice age. These loads depressed the earth and caused its present shape. But the earth is now observed to be rising in those places, and I think that it is in the process of slowly flowing back to a spheroid shape. Rather than being permanently strong, the earth is weak and malleable.

The precision with which satellites may be tracked should make their evidence very valuable as to whether the numerous indications of the movement of ice were actually caused by ice or should be attributed to some other phenomenon such as flooding.

### Rapid Accumulation of Ice

The ice caps have been ascribed to the slow accumulation of snow, but such a process would have taken many thousands of years. With a very powerful application of facts and logic, Patten[12] has argued that snow was not the major source of the ice, as follows:

First, the ice was apparently many thousands of feet deep near the center, thinning out toward the edges. If moisture-bearing wind had blown onto the ice cap, it would have been chilled and precipitated snow within probably no more than 100 or 200 miles. The greatest depth would then have accumulated around the periphery, which is contrary to the facts.

Second, if ice accumulated slowly, when it was deep enough to begin to move, it would have followed the path of least resistance. That is, it would have moved the most in the lowest elevations, eroding wide, smooth ice valleys as it went.

If it was deep enough to move over higher elevations, it would have rounded them off somewhat, but since more material would have been carried away from the valleys, it would have tended to exaggerate differences in elevation. In fact, it would have tended to corrugate the landscape as it moved. This is definitely not the effect the glaciers seem to have left. The glacial ice had a tremendous leveling effect, as shown in many midwestern states.

Third, Patten's most important point was that the ice must have moved as though it accumulated rapidly; that is, it moved outward from the center in a seemingly irresistable, radial pattern. If it had piled up rapidly near the geo-


**Figure 2. On this map, the contours show the amount of uplift which has taken place, presumably since the melting of the ice. The contours are marked in feet.**

magnetic pole until it was forced to move outward, it could not have followed the path of least resistance but would have moved straight out from the center. If this movement had radiated from the north pole, all of the ice would have moved south along the lines of longitude.

However, the center of the northern ice cap was between Greenland and Canada, so the movement was southward near the Ohio-Pennsylvania line. East of this, the ice had a slight easterly trend. Westward of this line, the ice had a westerly trend which increased across Canada until the ice in Alaska moved nearly southwest.

In all of this, the movement was directly outward from the geomagnetic pole except where prominent terrain features influenced local movement. The same radial pattern was found in Ireland and England. It was especially pronounced as the ice moved across the Scandinavian Peninsula. Flint[13] cites a study by Hansen as follows:

> The glacial deposits on the plains of Germany, Poland, and Russia contain "immense quantities" of rock of Scandinavian origin. It has been calculated that the volume of this drift is so great that were it removed it could be used to fill up the basin of the Baltic Sea and the basins of all the lakes in Scandinavia, and that enough would be left over to add a layer 25 meters thick to the surface of the Scandinavian Peninsula.

Flint admits that this may be exaggerated but it is a fact that it would require great ice movement to carry rock across the Baltic. It is also noteworthy that radial lines drawn on a globe, from the geomagnetic pole across Scandinavia, will fall upon Germany, Poland and Russia. Furthermore, if the drive outward from the center stopped when the ocean ice melted, part of the ice on the peninsula would then begin to move westward to the sea, no doubt deepening and widening the Norwegian fiords as it went.

### The Historical Record

No proposed mechanism for the Flood is worth consideration if it does not agree with the facts of history as recorded in Scripture. Notice the implication of God's question to Job (Chapter 38:8): "Or who shut up the sea with doors, when it burst forth, as if it had issued from the womb?" Rainfall was an important phenomenon at the time of the Flood, but it does not cause the ocean to rush upon the continents.

No better descriptive phrase could be found than, "the same day were all the fountains of the great deep broken up", Gen. 7:11. The suddenness and violence of events is emphasized when this passage is taken with the question addressed to Job.

Possibly the most remarkable correlation is found in the second part of Genesis 8:1, ". . . and God made a wind to pass over the earth, and the water asswaged." If the ice accumulated rapidly at the beginning of the Flood period, then as soon as the storm was over, great winds would expected.

In equatorial regions the air would have been heated and would rise, but over the ice, it would have been chilled and would sink. This would be the start of the great southeasterlies which blew off the ice caps for many years. As the glaciers melted, dust and dirt were picked up and then deposited as windblown soil, or loess. These soils are found in great belts in central United States and in Europe, Russia and Siberia.[14]

### What are the Problems?

Every theory which seems to help answer some problems invariably raises others. Patten struggled with the question, where did the ice come from? Despite an ingenious proposal, he was severely criticized. Unfortunately, there are no striations, drumlins or erratic boulders in the atmosphere to provide a record. But the evidence shows that the ice did not move as though it accumulated slowly, and it did move as though it accumulated rapidly.

Geologists have claimed for many years that all of the continents have been below sea level at one time or another and creationists agree. The enormous forces required to cause the rise and fall of continents have been largely ignored. Creationists have been reluctant to propose that they all sank at one time, probably because they would immediately be challenged to name the forces capable of accomplishing this. The evidence provided by the worldwide system of mid-ocean rifts was not even recognized until the International Geophysical Year in 1958.

The major problem with this theory is undoubtedly the matter of sedimentary deposits under the outer edges of the ice caps. There is no problem in much of northeastern Canada because there is a very large area where basement rock is close to the surface. Outside of that region, however, there are large areas which were covered with ice which have deep sedimentary strata.

If the ice descended very rapidly near the geomagnetic pole, considerable flooding and deposit of sediments may have taken place before the ice reached its maximum extent. The question also arises as to whether the outer edges of the ice cap may have been lifted and floated for a time by the ocean waters.

Although this theory certainly raises questions, it also helps to answer others. Patten pointed out the necessity for very low temperatures to deep-freeze mammoths and cause extensive permafrost. A very moderate amount of cold, at greater distances from the ice caps, would also freeze the bird tracks, worm trails, ripples in sand and the many other delicate features preserved in sedimentary rock. Overnight temperatures no lower than 20° F. will freeze mud to rock-like hardness; then sedimentary deposits could form a contact line before thawing took place.

### Summary

The purpose of this study was to determine what effect two great ice caps would have on the crust of the earth. In all probability, the effect would be precisely the same whether the buildup was slow or rapid. The validity of this theory is entirely dependent on the following assumption: the first effect of the accumulation of ice would be internal pressure.

If the interior of the earth was a strong, rigid mass, it would have easily supported the ice against the pull of gravity. However, if the part of the earth which is between the ice caps is more like a column which is not rigid, then under tremendous pressure, the center of this column will begin to fail.

As long as the crust of the earth provided support, like hoops around a barrel, the ice could be supported. When the pressure became excessive, the thinnest section would have ruptured and then been uplifted. Since the ocean floors show unmistakeable evidence of uplift, the flooding of the continents and their subsequent sinking below sea level seem to be very reasonable consequences.

### References

[1] Burdick, C. L. 1967. Ararat–the mother of mountains, *Creation Research Society Quarterly*, 4(1):5-12.
[2] Read, J. G. 1972. Film Strip, The mountains of Ararat. Creation-Science Research Center, San Diego, Ca.
[3] Ewing, M. and L. Engel 1962. Seismic shooting at sea, *Scientific American*, 206(5):123-124.
[4] Longwell, Knopf and Flint Physical geology. Third Edition. 1955. John Wiley & Sons, New York, N. Y., pp. 14-15.
[5] Cook, M. A. 1966. Prehistory and earth models. Max Parrish & Co. London, England, p. 91.
[6] *Ibid.*, p. 121.
[7] *Ibid.*, p. 134.
[8] Longwell, Knopf and Flint, *Op. Cit.*, p. 16.
[9] *Ibid.*, p. 17.
[10] Cook, M. A., *Op. Cit.*, p. 123.
[11] Wilson, J. Tuzo 1967. IGY, the year of the new moons. Alfred Knoph, New York, N. Y., pp 85-86.
[12] Patten, D. W. 1966. The Biblical Flood and the ice epoch. Pacific Meridian Pub. Co. Seattle, Wa., pp. 104ff.
[13] Flint, R. F. 1957. Glacial and Pleistocene geology. John Wiley & Sons, New York, N. Y., p. 80.
[14] *Ibid.*, pp. 181-193.