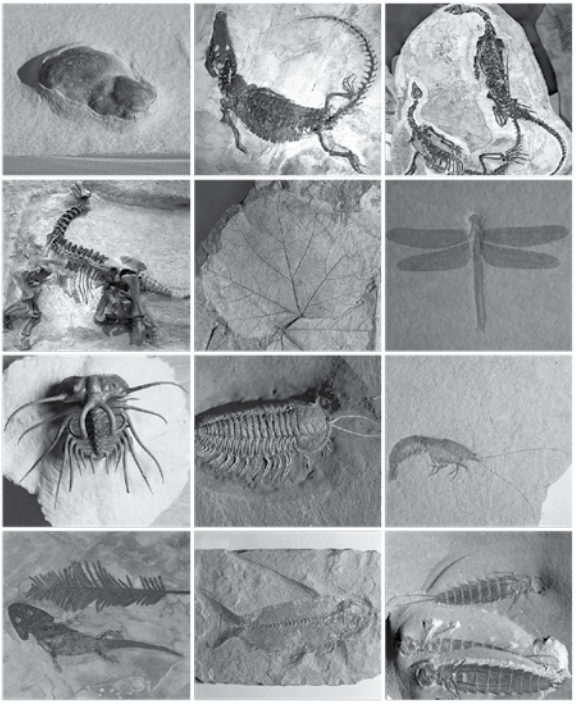
GENESIS AND SCIENCE

WHERE IS THE EVIDENCE GOING?



LEONARD BRAND

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Chapter 1

Yellowstone Fossil Forests

In a discussion of Genesis, science, and where the evidence is going, our first question is whether scientific practice and confident belief in the Bible can be compatible. My answer begins with an example taken from fossil forests.*

In the 1960s and early 1970s, a small group of Christian scholars were asserting that a particular fossil deposit in Wyoming indicated that the timescale for life on Earth was much longer than could be reconciled with the Bible. The fossil forests seen on the hillsides of Yellowstone National Park appear to be a series of separate fossilized forests, one horizontal forest level above the other, with each successive forest killed and buried by a flow of volcanic ash and debris (fig. 1.1).

The forests contain upright trees, horizontal fallen logs, and stumps in an upright position of growth. At the base of each forest level is a thin layer of fine volcanic sediment, interpreted as the soil in which the forest grew. Researchers had counted more than sixty forest levels (some researchers claimed many more), and many of these levels contained large trees, with as many as a thousand annual rings. When the rings in all the levels are added up, they do not fit into a timescale of a few thousand years, especially considering that these Eocene fossil forests are above many

* If you are already acquainted with this research project, you may wish to jump down to the last paragraph of this chapter.

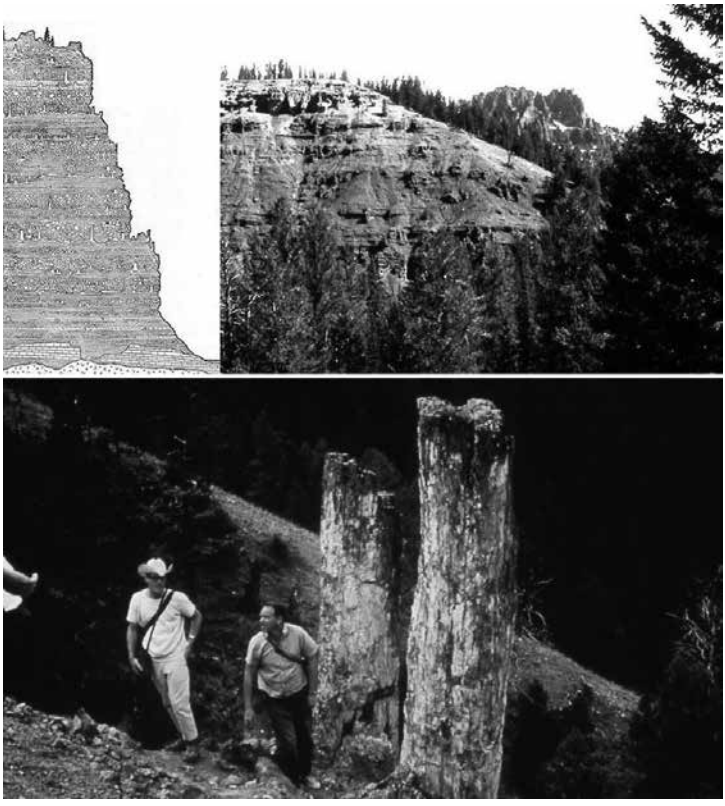

Figure 1.1. *Upper right*, a hillside in Yellowstone National Park composed of a series of horizontal debris flows with fossil trees; *upper left*, a diagram of the hillside, modified from the 1878 Holmes report; *bottom*, two large fossil tree trunks beside the living forest.

older fossil-bearing rock formations dated to the Paleozoic and Mesozoic eras (fig. 1.2). Even a casual study of the hillside where these exposed fossil forests can be seen supports the impression that each of these levels was an actual forest killed by volcanic action and buried where it grew; then, another forest grew on top of its remains.[1]

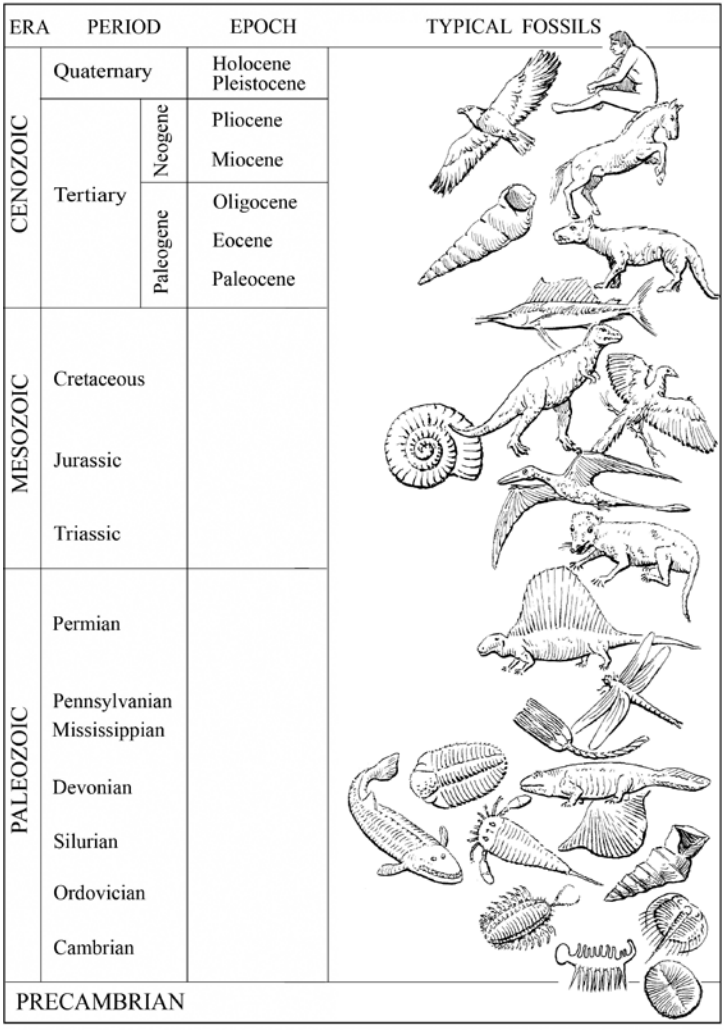

Figure 1.2. The geologic column and the standard geologic timescale, with representative fossils for each part of the column. (Modified from Brand and Chadwick, *Faith, Reason, and Earth History*, 2016.)

At the time of these discoveries, a number of my friends abandoned their confidence in Scripture, and some lost their faith in God because it seemed that these fossil forests could not be reconciled with a belief in the Bible as a trustworthy, factual account of history. Was their decision justified by the evidence? Or should they have held up the Bible as a more reliable source of information than human scientific discoveries? Since it seemed so clear that the forests grew where they were preserved, to look for an alternative explanation may have seemed foolish. Why not just face the scientific evidence and move on with life?

I believe that we have reason to take a different approach. A group of Earth scientists and their graduate students believed there was such a reason—their faith in the Bible as a trustworthy book that describes Earth history correctly, including the basic time frame of a few thousand years since Creation. They did not know what a better explanation for the Yellowstone fossil forests would look like, but they began a very careful study of those trees, stumps, and volcanic sediments, digging deeper into the evidence than others had. They understood that the scientific evidence and explanatory models accepted at any given time are not always the whole story, even if the scientific community has great confidence in them. Science keeps moving ahead and often brings surprises.

They asked the following questions in this research: What evidence do we see in these fossil forests? Does the evidence fit what would be expected if the trees grew where they are now? Several years of negotiating the steep, slippery mountain slopes of Yellowstone yielded unexpected new evidence.[2] We could assume that if a forest had grown where it was buried, we would find certain indications. For example, the types of trees on each level should represent a coherent forest ecology—trees that are expected to grow together and leaves, needles, or pollen on the forest floor that reasonably match the species of trees growing

there. If the soil is preserved with leaves in it, we would expect that the leaves near the surface of the soil would be better preserved, and the decayed leaves would be lower in the soil. Fallen trees in the forest should show various stages of decay, according to the length of time they had lain since falling. Standing trees would have roots extending out into the soil level.

The thorough work of these researchers in the 1970s revealed that much of the evidence did not match what was expected in a forest that had been preserved where it grew. Often, the trees within a particular level represented a wide range of environments, perhaps from high-altitude to lowland, and even subtropical, forests. A lot of leaves and pollen were preserved in the soil zones at the base of the trees, and they generally did not match the types of trees found on that level. When a forest of pine or sequoia trees has a soil base that contains mostly broad leaves and pollen from hardwood trees, something is wrong. This does not match the model of a forest that was buried where it grew. Furthermore, the wood in these fossil trees was consistently very well preserved, and the layers lacked decaying trees that would be expected in the life cycle of a normal forest. Where the bases of trees could be seen, their large roots were broken off, which would not be expected if a tree was preserved where it grew.

The presumed soil zones, referred to as organic zones, contained plenty of leaves and preserved pollen. But that was where the resemblance to soil ended. These organic zones were thin layers of fine volcanic ash, with well-preserved leaves all the way through the layer. They had the characteristics of a layer of ash and leaves deposited by flowing water.

What does this evidence point to? It fits the pattern we would expect for forests that grew somewhere else and whose trees were killed and transported into place by flowing water. Later, these trees were buried by rapid volcanic flows, one level at a time, in their new location. But how could that be? Many of the tree

trunks and stumps were upright, as if they had grown there. If they did not grow there, how could this be explained? This was the primary feature that convinced previous researchers that the forests had grown and were fossilized in the Yellowstone area.

Then, in 1980, the Mount St. Helens volcano in Washington State erupted with a vengeance. It killed many thousands of trees and leveled the surrounding forest. An untold number of trees were washed into Spirit Lake, on the flank of the volcano, covering part of the lake's surface with a huge log raft (fig. 1.3). As time passed after the volcanic eruption, a surprising thing happened. The tree trunks began to get waterlogged at their lower ends, turned upright as they began to sink, and finally rested on the lake bottom in an upright position. So, it turns out there is another way to explain preserved, upright tree trunks! And if the eruption had been followed by a sequence of volcanic debris flows into the lake, the multiple flows would have entombed the trees and produced layered deposits very similar to the Yellowstone fossil forests.

When Mount St. Helens exploded, another unexpected thing happened. A large volume of water flowed down the valleys on the mountainside, taking a huge volume of mud with it. In this mudflow were many tree stumps that ended up being scattered along the lower parts of the valleys. When the transported tree stumps stopped moving, they came to rest in an upright position even though they had been carried at high speeds in a chaotic mudflow for up to sixty miles. It was clear the stumps were brought in by the mudflow and had not been growing in the valley because some came to rest upright on a highway. Mount St. Helens showed us that it is not surprising to find transported tree trunks and stumps standing upright, even though they did not grow where we find them today.[3]

This illustrates a broader concept: geological processes often do not match what we would intuitively expect. It is necessary to

Figure 1.3. Spirit Lake, on the flank of Mount St. Helens, with its raft of logs after the eruption of the volcano.

see actual geological processes in action to know what to expect. Keep this in mind as you read.

At this point, we have to ask whose actions revealed more wisdom—those who gave up on the Bible when they thought they had reasons for doubt or those who allowed biblical insights to lead them into productive scientific research? This challenging research in Yellowstone was not amateur work but was done with scientific rigor and resulted in several research papers being published in reputable scientific journals. Ironically, at the conclusion of this research, Yellowstone National Park employees replaced the signs describing the fossil trees as forests that were buried by volcanic sediment where they grew. The new signs simply said the fossil trees were buried by volcanic sediment flows (although more recently, they brought back the original signs).

Let us ask the hard questions. Is this a legitimate process, allowing Scripture to interface with science? Does it question and challenge scientific explanations? Or were the results of this fossil forest project just a lucky coincidence? It is important to know

the answers to these questions, but adequate answers require us to spend time pondering how worldviews, assumptions, and the scientific process relate to religious faith.

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