

THE FIRST GEOLOGISTS OF HUMANKIND WERE THE ANCIENT ISRAELITES WHO MADE THEIR WAY FROM EGYPT TO THE LAND OF ISRAEL

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Abstract: The biblical book of Genesis contains a description of the creation of the world, which is similar in large measure to the order of Creation known to science today. This article offers an explanation as to how those who wrote the Old Testament could have known the quite accurate order of Creation they set down in writing. In fact, the group of people from amongst the tribes of Israel who made their way from Egypt to the Land of Israel might actually be considered humankind’s first geologists, predating the Greek and Roman philosophers and thinkers by more than a thousand years.

Keywords: *Geology, Stratigraphy, Bible, Creation of Earth, emergence of life, emergence of humankind*

I. FOREWORD

This article presents an explanation as to how the ancient Israelites were the first geologists of humankind that were able to describe the fundamental process of the creation of the Earth, as rendered in the biblical account at the start of the book of Genesis, in a concise manner, in an order largely similar to the scientific description extant in our time and the geological explanations known to us today. In fact, the group of people from amongst the tribes of Israel who made their way from Egypt to the Land of Israel might actually be considered humankind’s first geologists.

The Israelites departed from Egypt in 1679 BC and wandered in the Sinai desert for forty years before arriving in the Land of Israel, the land of their forefathers. Along their route they observed and studied the geological strata, mainly learning to differentiate between the magmatic and the sedimentary layers, and became familiar with the fossils found in the latter. They can therefore be credited with developing humankind’s first knowledge in the rudiments of geological science.

Until now, the scientific foundation of geology has been attributed to a series of Greek and Roman philosophers, the first of them being Thales of Miletus in 625 BC. According to Wikipedia (in the entry dealing with the history of geology), other notable contributors to establishing geology as a science included Aetius, Thales, and Democritus – 460-371 BC; Anaximenes – 583-526 BC; Pythagoras – 570-495 BC; Xenophon – 560-478 BC; Aristotle – 384-328 BC; and Pliny the Elder – 279-223 BC. In any event, the Israelites who had escaped from Egypt began to investigate geological science a thousand years and more before these Greek and Roman thinkers.

II. THE BIBLICAL DESCRIPTION OF THE CREATION OF THE EARTH, WITH REFERENCE TO GEOLOGICAL EXPLANATIONS

a. The Israelites’ Course from Egypt through Sinai to the Land of Israel

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At an early period, when the Mideast including the Land of Israel was in the grip of a terrible drought, the people of Israel went down to Egypt to find food. At the time the Egyptians grew crops by means of irrigation using the waters of the Nile River, which was still not directly affected by the drought in the Mideast.

The Israelites remained in Egypt for a prolonged period, during which time the Egyptians enslaved them. When Moses finally led the Israelites out of Egypt on their way back to their homeland, the Land of Israel (Canaan), the Bible tells us that their journey took forty years.

The Israelites' course upon their departure from Egypt passed through the Sinai Peninsula, then through the Israeli Negev; afterwards they continued through trans-Jordan and ultimately entered the Land of Israel (Canaan) through the city of Jericho (which is in the east of the Land of Israel, on the west bank of the Jordan River (Fig. 1). On their way, the Israelites passed above various geological strata that in principle can be divided into two different types of composition: magmatic formations that constitute the basic strata of the Earth, and sedimentary layers with their origins in marine deposits (Fig. 2).

At the start of their course, the Israelites passed from Egypt through the waters of the Gulf of Suez to Sinai (Fig. 2, pt. 1). They continued southward in western Sinai, along the shore of the Gulf of Suez, in a relatively flat area, above sedimentary layers to pt. 6 (Fig. 2). Most of the sedimentary layers in this sector are made of chalk, marl, and sandstone. Continuing to pt. 7 (Fig. 2), they passed over another relatively flat area, above alluvial deposits of clays and gravel of the Quaternary age, which had been deposited due to wind and water erosion and are embedded mainly above the sedimentary layers. Their course along the shores of the Gulf of Suez passed along the western margins of magmatic deposits.

Continuing through pts. 8-9 (Fig. 2), they passed through a mountainous region including watercourses (wadis) along which the Israelites mainly walked. This area is situated above magmatic deposits including dykes, and mixtures of rocks of varying composition such as granite, gneiss, quartz diorite, gabbro, and volcanic rocks (pt. 8 is in the vicinity of Mt. Sinai, from which Moses descended with the Two Tablets of the Law which he gave to the Israelites). Continuing on their course to pt. 11 (Fig. 2), near the present-day city of Eilat, the Israelites passed along the shore of the Gulf of Eilat (Aqaba), at the margins of magmatic layers. Further northward, at pt. 12 (Fig. 2) they passed through the Israeli Negev, above a cross-section of sedimentary layers with varying compositions of chalk, dolomite, marl, and clay.

I presume that a group of people amongst the Israelites took an interest in the geological subject matter along their course, and that they also collected fossils and brought them to their camps and discussed them at length. They knew that the fossils were a product of marine deposition, by comparing them to the seashells that existed along the shores of Sinai, which in part are similar to the fossil seashells they saw in the geological layers. Their minds and curiosity were no different from ours, and by comparing the sedimentary layers which had sunk in the sea in an orderly manner, containing horizons of various thicknesses, etc., as opposed to the mixed and unordered magmatic deposits which lay at the foundation, they were able to determine the "waste and void" (Hebrew: Tohu vavohu), which are the basic layers, and afterwards above them the sedimentary layers that had sunk in the sea, and therefore to determine the creation of the Sea and the Land.

Pursuing their studies, the Israelites came to a conclusion as to what the main stages were in the creation of the Earth. Of course, they had no way of estimating the geological time it had taken, so they arranged the stages of Creation in accordance with the days of the week. The explanation of the stages of Creation as described in the book of Genesis is similar in large measure to the order of the evolution of the Earth as is known to science today.

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Figure 1: Israel's Exodus from Egypt and Entry into Canaan (Israel), after Gilbert, 1997
 The Israelites' course is marked by the dashed line with arrows. The numbered points along the route mark stations where the Israelites camped for extended periods.

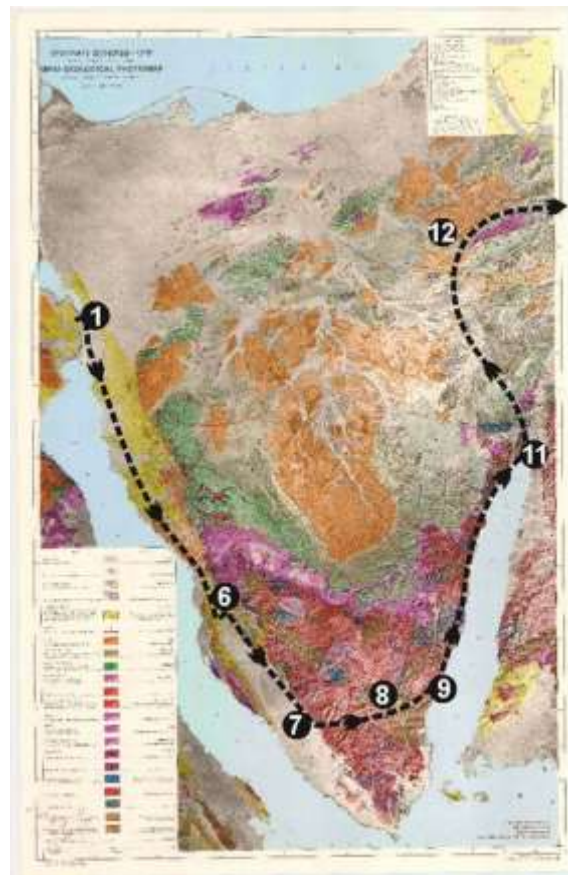


Figure 2: Sinai – Geological Photomap, Eyal et al., 1980
 The Israelites' course is marked by the dashed line with arrows. The numbers indicate sectors with varying compositions of geological strata, differentiating mainly between magmatic deposits and sedimentary layers.

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b. Explanations of the Description of the Creation of Earth in Genesis

“In the beginning God created the Heaven and the Earth. *And the Earth was waste and void*” (Hebrew: Tohu vavohu). As explained above, the Israelites passed through the Sinai Desert and the Israeli Negev, and they had access to the shores of the Red Sea—the Gulfs of Suez and Eilat (Aqaba) on either side of the Sinai Peninsula (Figs. 1 & 2). From these areas they were able to learn about the structure and composition of the geological layers, with the magmatic deposits appearing in mixed and changing form as regards strength and color, in no clear order. To this they gave the name “*waste and void*.” Since these deposits were at the bottom with the sedimentary layers above them, they understood that they should be attributed to the beginning of Creation, so they were assigned to the “*one day*”—*the first day*.

Likewise, the Israelites understood that for what they could see to continue to be created, there had to be light and darkness already at the beginning of Creation in the first stage, so that too was assigned to the “*one day*”—*the first day*. Of course, they did not understand that the Earth is round and turns on its axis, so when the sun shines half of the Earth is lit, and the other half is in darkness. We may assume that already in the first stage of creation of the Earth it was round and turned on its axis, i.e., the Israelites were entirely reasonable in how they regarded the creation of light and darkness, though by intuition rather than on the basis of knowledge.

“*And God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament: and it was so. And God called the firmament Heaven. And there was evening and there was morning, a second day.*” The Israelites understood that after the creation of the “waste and void” deposits the Earth’s tumult had subsided, and since they knew (as we know today) that the Heaven and the sea had been created and exist to the present day they understood that the sedimentary layers had been created in the sea, and for those layers to sink into the sea, the sea had to have been created first, *so they assigned the creation of the firmament and the sea to the “second day.”*

“... *Let the waters under the heaven be gathered together into one place, and let the dry land appear: and it was so. And God called the dry land Earth; and the gathering together of the waters called the Seas.*” Here the emphasis is on a description of the creation of the sea as created by God on the second day. The Israelites saw that the waters of the sea cover only part of the expanse of the Earth, while part of it is dry land, so they assigned that too to the early stages of Creation.

“... *And the earth brought forth grass, herb yielding seed, and fruit tree bearing fruit after its kind.*” The Earth having been created, the Israelites understood that it began to support agricultural crops, as it does to this day, and assigned that to the “third day.” However, here, as is known to science today, they did get the order wrong, because life on land came only after the beasts and fishes of the sea, the latter appearing by the biblical account on the fifth day of Creation of the Earth.

“*And God made the two great lights; the greater light to rule the day, and the lesser light to rule the night: he made the stars also... a fourth day.*” Here the Israelites thought that the Earth stood at the center of the world, and that the sun and moon and stars were created for its sake. Of course, they did not know that the Earth is round and revolves around the sun, and they did not understand the cosmological system. Likewise, they did not understand that the Earth turns on its axis and therefore every point on Earth’s surface is turned toward the sun half the time and then it’s daytime, while in the other half of Earth it’s nighttime. Since their intention was to explain all the basic natural phenomena pertaining to the creation of Earth, their description regarding the fourth day was based on the knowledge then extant regarding Creation, and they got it wrong. This was not a fundamental mistake in thinking, because it need be noted that this mistake remained widely held until several hundred years ago, when science discovered and showed that the sun is at the center of the solar system and the planets revolve around it. As regards the creation of day and night, here on the fourth day there is a certain recapitulation of the creation of day and night on the second day.

“*And God said, Let the waters bring forth abundantly the moving creature that hath life, and let fowl fly above the earth in the open firmament of heaven... a fifth day.*” On the fifth day of Creation, the account tells of the creation of the life found in the sea, and that indeed is the correct order, as is known to science today. This was the conclusion the Israelites came to in accordance with the various fossils they found in the sedimentary layers, knowing that these layers had sunk into the sea. It is then mentioned that the fowl in the sky were created, and that is largely in line with the order of epochs in the creation of life on Earth. Apparently, they came to this conclusion due to not having found any winged creatures in the sedimentary layers, but since winged creatures exist, they had to have been created after the creatures that live in the sea.

“... *Let the earth bring forth the living creature after its kind, cattle, and creeping thing, and beast of the earth after its kind... And God created man in his own image... the sixth day.*” It’s interesting that the Israelites determined that the various beasts and plants were created before man. I think they did so by intuition. Furthermore, in marshes and alluvial deposits they may have observed fossils of beasts but not of man, therefore man was created last, which is the reasonable order. In the description of God’s Creation on the sixth day, emphasis is placed on the fact that

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man is most important, that he will multiply upon the face of the Earth, by eating the food provided by the fish of the sea, the fowl of the sky, cattle, and everything living created on Earth.

IV. CONCLUSION

This article has offered an explanation as to how the ancient Israelites, who escaped from Egypt and passed through the Sinai Peninsula on their way to the Land of Israel (Canaan), were able to describe the fundamental process of the creation of Earth, as written in the biblical account at the start of the book of Genesis, in which the order of Creation that is described is similar in large measure to the scientific account extant in our time and to the geological explanations known to us today. In fact, ***the group of people from amongst the tribes of Israel who made their way from Egypt to the Land of Israel might actually be considered humankind's first geologists.***

The Israelites' Exodus from Egypt is customarily dated to circa 1679 BC. The Bible tells us that they wandered in the Sinai desert for forty years before arriving in the Land of Israel, land of their forefathers. Until now, the scientific foundations of geology have been attributed to a series of Greek and Roman philosophers, the first of them being Thales of Miletus in 625 BC. But it turns out, on the evidence of the Bible, that these Greek and Roman thinkers were predated by a thousand years and more, by humankind's first geologists: the ancient Israelites.

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