

CHAPTER 5

GENESIS: CONCORDIST INTERPRETATIONS

THE OCEAN SALT ARGUMENT FOR A YOUNG EARTH

One argument still being used in many young earth creationist publications and websites is the ocean salt argument.

Fresh water from rain and snow flows over dirt and rocks into streams and rivers and finally into the ocean. On the way to the ocean, it dissolves many salts (minerals such as calcium, sodium, and iron). Water evaporates out of the ocean but leaves salts behind.

Based on just these facts, it would seem like the total salt in the ocean should be constantly increasing. In the late 1800s a scientist named John Joly tried to use this information to determine the age of the oceans, assuming that the oceans initially were pure water. He calculated the amount of sodium added to the ocean each year and divided that into the total amount of sodium already in the earth's oceans. Joly calculated an age of the ocean between 80 and 90 million years ("An Estimate of the Geological Age of the Earth," *Smithsonian Institution Annual Report for the Year Ending June 30, 1889*; Government Printing Office, 1901).

What Joly didn't know was that sodium and other salts are removed from the ocean in several ways. These include the formation of salt flats, chemical reactions of salts with the ocean floor, and living organisms taking up salts and depositing them via their skeletal remains on the ocean floor. Salt beds, in some cases more than a mile thick, are found in the middle of rock layers in various places around the earth (Kozary et. al., "Incidence of Saline in Geologic Time," GSA Special Paper, 1968).

If sodium is removed from the ocean at the same rate as it enters, establishing *equilibrium*, then Joly's calculations do not give the age of the ocean. Instead, they give the residence time of sodium, that is, the average time that a sodium atom stays dissolved in the ocean water before it is removed. As an analogy, imagine a department store where new customers enter the store at a steady rate of two customers per minute. Once the store has been open for a while, customers leave at the same rate as they enter. Each minute, two customers leave and two new customers enter. Now suppose you count 50 customers in the store. That would not mean that the store has only been open for 25 minutes; rather, it would mean that each customer on average spends 25 minutes in the store before leaving—the residence time of customers. The store itself could have been open for one hour, eight hours, or much longer.

Scientists in the 1900s studied the rates at which various salts enter and leave the ocean. A table of residence times for many salts was edited by J. P. Riley and G. Skirrow and published in *Chemical Oceanography* (Academic Press, 1965). Residence times vary from about 100 years for aluminum, which is removed quickly from ocean

water, to 260 million years for sodium, which is removed slowly. The mainstream scientific community has continued to study the processes that add and remove salts from ocean water. Numerous observations support the conclusion that, aside from some temporary fluctuations, ocean salts have been in equilibrium for billions of years.

In 1974 Henry Morris and other young earth creationists published the book *Scientific Creationism* (Creation-Life Publishers, 1974). This book lists several residence time values from Chemical Oceanography data but instead describes them as “years to accumulate in ocean from river inflow.” The residence times were mistakenly presented as age calculations. Since most of the times listed are much less than a billion years, they were presented as proof that the age of the ocean had to be less than billions of years. Since most of the times listed are much longer than 10,000 years, they were not described as true age measurements but as “upper limits” of the age of the ocean. (They assumed that the ocean was initially created with some salt already in it.) Melvin Cook, a young earth advocate, wrote in *Prehistory and Earth Models* (Max Parrish, 1966) that ocean salts cannot be used to calculate ages because salts are removed from the ocean. However, many other young earth advocates followed the lead of *Scientific Creationism* and began using this argument for a young earth in their publications and talks. [The preceding four paragraphs summarize chapter 5 of *Science Held Hostage* by Howard Van Till, Davis Young, and Clarence Menninga (Downers Grove, Ill.: InterVarsity Press, 1988).]

In 1990 a more sophisticated version of the ocean-salt argument was published by young earth creationists Steve Austin and Russell Humphreys (“The Sea’s Missing Salt: A Dilemma for Evolutionists,” *Proceedings of the Second International Conference on Creationism, 1990*). They agreed that some sodium is removed from the ocean; however, they argued that sodium is not in equilibrium. They listed eleven mechanisms which add sodium to the ocean and seven mechanisms which remove sodium from the ocean. They attempted to calculate the total rates of sodium inflow and sodium removal. They argued on the basis of their calculations that sodium removal is only 27 percent as fast as sodium inflow. They then used their inflow and removal rates, along with the total amount of sodium currently in the ocean, to calculate a maximum age for the ocean of 62 million years.

This new version of the ocean-salt argument is an improvement over the earlier versions. It is commendable that Austin and Humphreys noted that there are several mechanisms for removing sodium, and that they tried to account for them. However, the use of this argument by young earth creationists differs from ordinary scientific practice in several important ways. Austin and Humphreys concluded that the earth cannot be billions of years old; however, several other possible conclusions can be drawn from their calculations.

- ▶ They might have underestimated the rate of sodium removal in some of the seven mechanisms in their list.
- ▶ Other sodium removal mechanisms might exist that they failed to include on their list.
- ▶ Sodium levels in the ocean might have fluctuated over the history of the earth, with some periods (such as the present) having higher sodium influx rates and other periods in the past having higher sodium removal rates.

It would be scientifically prudent to mention these other possible conclusions, especially given geologists’ many other lines of evidence that the earth is old and that sodium has been in equilibrium for billions of years. But young earth creationist publications, eager to use Austin and Humphreys’ calculations as evidence for a young earth, seldom if ever mention these other possibilities.

Austin and Humphreys’s calculations have not undergone peer review by the broader scientific community—a crucial step in checking their validity. Their calculations of sodium inflow and removal rates appear to have been published only in young earth creationist circles rather than in mainstream scientific journals. Young earth creationists frequently accuse mainstream scientists of ignoring or suppressing this work because of bias against a young earth. But, in fact, mainstream scientists often welcome challenges to their standard models if those challenges are based on careful calculations and sound data. While it is true that mainstream scientific

journals would be reluctant to publish an article explicitly arguing for a young earth, it should be possible to submit these calculations to a scientific journal or conference, not as a young earth argument, but simply as a challenge to the idea that the oceans are currently in sodium equilibrium.

Glen Morton, a geologist and an old earth creationist, has reviewed this work. He argued that Austin and Humphreys underestimated some of the sodium removal rates on their list of seven mechanisms and that they missed a few others. His calculations imply that sodium in the ocean really is in equilibrium. Morton's calculations can be found at these websites:

- ▶ www.home.entouch.net/dmd/salt.htm
- ▶ www.asa3.org/archive/evolution/199606/0051.html
- ▶ www.asa3.org/archive/asa/199711/o512.html

Young earth creationists, however, have rejected Morton's arguments and continue to use Austin and Humphreys' arguments in their websites and publications.

In ordinary scientific practice a result such as this—one that has not yet been adequately peer reviewed and that conflicts with many other well established scientific results—would be put forward cautiously until it could be studied further. Young earth creationist publications and websites, however, claim that this result proves that the earth must be young and that all of the mainstream scientific arguments for an old earth must be wrong. This misleads Christians who are not scientists and who don't know the larger scientific picture. This argument is not being used as a scientific hypothesis; instead, it is taken out of its larger scientific context and used to promote a particular interpretation of Scripture.