

3. the lack of features associated with subaerial volcanism,
4. the lack of bubbles in the volcanic rocks suggesting the layers all formed under high water pressure, and
5. the virtual absence of aerosols, detrital minerals, and volcanic ash.

So, if there was oxygen in the seawater to form hematite, there was also oxygen in the atmosphere:

“The implications are profound: if oxygen existed at near-modern levels in such a broad, deep body of water, the atmosphere must have been oxygenated also. Presumably that oxygen was produced by organisms capable of photosynthesis, also pushing back their appearance.”¹⁰

Pushing back an oxygen atmosphere by a billion years also pushes back the evolution of photosynthetic bacteria a billion years or more, since evolutionists believe the oxygen had to come from these bacteria. This result does not leave much time for the supposed evolution of these complex bacteria. Such rapid evolution of single-celled creatures from chemicals makes evolution ever more astonishing: “Envisioning the steps that led to this complex biochemistry [of photosynthesis] is mind-boggling.”¹¹

Furthermore, the hematite was in the form of single crystals indicating that they were not made by ultraviolet light. The researchers go on to say that geochemical analysis of the hematite crystals suggests that they formed at temperatures greater than 60°C from hydrothermal discharges rich in ferrous iron that spewed into cool, oxygenated waters.

This new evidence seems convincing to many and offers evidence “that the Earth’s atmosphere held significant amounts of oxygen far earlier than previously thought.”¹⁰

Creationist interpretation

Creationists would predict that significant quantities of oxygen were always in the atmosphere, being created that way. The new information

on sulfur isotopes and BIFs is trending more and more to this conclusion. It is even possible to tie the idea of the hydrothermal origin of iron and silica, forming BIFs as the chemical rich water spread into cooler oxygen-rich water, to the “fountains of the great deep”. But, this is a controversial subject within Flood geology and depends upon the location of the pre-Flood/Flood boundary, which still needs to be resolved.¹²

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Critics of helium evidence for a young world now seem silent

Russ Humphreys

After seven years, the “dogs of war” attacking a recent item of scientific evidence for a young world seem to have stopped barking.¹ The evidence is the retention but rapid loss of nuclear-decay-generated helium from radioactive crystals (zircons) in granitic rock allegedly 1.5 billion years old. I and fellow RATE² researchers Steve Austin, John Baumgardner, and Andrew Snelling showed the retention/loss is evidence that the usual radioactivity-based billion-year ages for such rocks are grossly wrong, and that the rocks are only 6000 (± 2000) years old. Even before we finished the project, critics began sniping at it. Most of the critics were atheists or professing Christians with various old-earth views. They were very disturbed about the project’s strong support of the young biblical age of the earth. Table 1 lists their criticisms and my responses.

None of the critics published their denunciations in peer-reviewed scientific publications. Instead they were “lone-ranger” opinions in unreviewed venues such as Internet sites and seminars. That contrasts starkly with the helium project. It was a multi-author effort, and it had more than seventeen reviewers and editors as it appeared in five technical publications, one of which is non-creationist.^{3–7} Or see several non-technical resources.^{8,9}

List of critics and my responses

Here is a table summarizing all the criticisms (plus two friendly questions) of the RATE helium research I know of since 2002, along with my answers. See references for venues of criticisms and replies.

Table 1. Criticisms and responses.

No.	Date	Critic (or commenter)	Main Criticisms	Main Replies
1	10/2002	Joe Meert ¹⁰	Mistook “-196°C” ¹¹ for “closure temperature” with wrong sign.	It was not closure temperature, sign was correct, and Meert totally misunderstood its significance. ¹²
2	9/2003	Hugh Ross ¹³	Said, “Helium is slippery”.	Yes ... “slippery” is what we want, in order to date zircons by the rate with which helium <i>slips</i> out of them. ¹⁴
3	12/2003	***** ¹⁵	Alleged that interface phenomena are significant.	Analysis of interface phenomena shows they are insignificant. ¹⁶
4	1/2004	Keith Wanser ¹⁷	Similar to above.	Same as above.
5	6/2004	Hugh Ross ¹⁸	Asserted that helium came into the zircons from outside them.	Minerals surrounding the zircons have far less helium and uranium than the zircons, showing the helium did not come from outside the zircons. ¹⁹
6	12/2004	(George Drake) ²⁰	(Friendly) concern about possible differences of pressure between biotite and zircon	Analysis of pressure differences shows they are insignificant. ²¹
7	12/2004	(Robert Brown) ²²	(Friendly) concern about lead diffusion from zircons	Lead diffusion rates, while interesting, are irrelevant to helium diffusion rates. ²³
8	3/2005	Kevin Henke ²⁴	Disputed about % retention, source of helium, and minor issues	Effects of all of these issues turn out to be vastly smaller than the factor of 100,000 discrepancy observed. ²⁵
9	3/2005	Roger Wiens ²⁶	Alleged that accumulation over time of radiation defects in zircons is significant	Effect turns out to be only a factor of two, within our error bars, and again vastly smaller than the factor of 100,000 discrepancy observed. ²⁷
10	11/2005	Kevin Henke ²⁸	Alleged that <i>in situ</i> hydrostatic pressure effect is significant.	Zircons are so hard that pressure or vacuum doesn't affect helium diffusion significantly. ²⁹
11	3/2008	Randy Isaac ³⁰	Claimed that a detailed history of site temperature is necessary to understand leak rates.	We assumed lower temperatures than Los Alamos Ice Age heat flow models, thus giving uniformitarians their best possible case. ³¹
12	9/2008	Gary Loechelt ³²	Claimed that during past eons, leak rates were much slower, and site was very much cooler.	“Lower leak rate” misunderstands experiments; “cooler site” misunderstands published Los Alamos heat flow models. ³³

Photograph from Los Alamos National Laboratory

**Figure 1.** Drilling rig at Fenton Hill, New Mexico, USA, which recovered zircons used in this project.

My referenced responses to items 8 and 10 cover most of the criticisms that have been made. Many people do not realize that I have answered item 10, dealing with pressure/vacuum effects, or item 12, which imagines fantastically low diffusion rates and site temperatures. Occasionally some of the critics have added minor tweaks and new dates to their articles, making the articles appear to be more recent than the main criticisms in them. I expect such developments to continue.

Conclusion

The critics, especially their seeming silence at present, have increased my confidence. My feeling after working through each criticism has been, “Is

that the best they can do? They must not have been able to find a real error of any importance.” I hope that you also will become more confident in this strong evidence for the young world presented in Scripture, thus gaining more confidence in the Bible itself.

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