

Letters

Hell May Be Hotter Than Heaven after All

In a recent article in this *Journal* (1), attention was drawn to the use of “chemistry-related mysteries” as a means to motivate students. As an example, the temperatures of heaven and hell are estimated from data given in the Bible. Quite surprisingly, it is found that heaven (525 °C) is hotter than hell (<445 °C).

This joke is old (dating back to the 1930s [2, 3]) and has been reproduced many times—for example, in a book (4) and, more recently, in the Internet. Although I find this apocryphal story innocent, amusing, and thought-provoking, the possibility that some students will not share the view cannot be excluded. In my opinion, playing with such a delicate matter as religion may not be the best pedagogical strategy, especially when trying to motivate students with very diverse or unknown backgrounds.

Furthermore, the conclusions drawn in refs 1–4 are seriously flawed, and errors should not be perpetuated (some inhabitants of hell may disagree on this).

In fact, from the biblical statement that a lake of (pure) sulfur exists in hell, it is correctly concluded (1–3) that sulfur’s (and hence hell’s) temperature must be between sulfur’s melting point, given in ref 1 as 115 °C, and its boiling point, given in both refs 1 and 2 as 445 °C. However, these two temperatures refer to atmospheric pressure (1 bar), and it is not unreasonable to suppose that a hellish place may have a hellish atmosphere, with pressures far above 1 bar—a point already made before (3). Since the critical temperature of elemental sulfur is 1041 °C (the critical pressure being 207 bar), we can in fact only infer from the biblical account that hell’s temperature is lower than 1041 °C. The additional argument presented in ref 1—that the temperature of hell should be close to the melting point of sulfur because a high vapor pressure would lead to sulfur’s complete evaporation after a certain time—ignores that such an outcome is also inevitable for the proposed temperature, if sufficient time is

allowed for (no limitation of this kind being expected). An alternative and more likely assumption is that of an atmosphere saturated in sulfur vapors and consequently in a state of liquid–vapor equilibrium for all eternity.¹

On the other hand, the estimated (1–4) temperature of heaven is based on a misinterpretation of the Bible, which in fact states that the total radiation falling on heaven is only 8 times that falling on Earth. From this ratio, a much lower heaven’s temperature, 231 °C, follows (5). Nevertheless, in Rev. 21:23 it is mentioned that “the light of the city of God comes neither from the Sun nor from the Moon”, rendering the estimation method of heaven’s temperature questionable. Hell (<1041 °C) may therefore be hotter than heaven (231 °C?) after all.²

Notes

1. Consideration of sulfur burning is an unnecessary complication that will not be addressed here.

2. Shortly after the invention of the telescope (17th century), some theologians tentatively located the Hell in the Sun, whose temperatures are now known to range from 5800 K (photosphere) to 15×10^6 K (center). Thus, the above estimates of the temperature of the Hell, based on older data, may turn out to be very conservative.

Literature Cited

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