

Question for the Author of “Uniformitarianism Re-Examined”:

Your paper provides a valuable framework for understanding the nuances of uniformitarianism, moving beyond simplistic interpretations and highlighting the diverse ways we seek to understand the past. My question focuses on how the acceptance of demonstrably non-uniformitarian events, like the Chicxulub impact, should influence our approach to choosing between uniformitarian and non-uniformitarian explanations in geohistorical research.

Context and Relevance:

The classic debate between uniformitarianism and catastrophism often frames the choice of explanations as a binary opposition. However, your paper emphasizes the complexity of uniformitarianism, distinguishing between methodological and substantive interpretations, and outlining four distinct forms of understanding in geohistory: understanding **what** happened (descriptive), **why** things happened (causal), complex Earth systems, and the geological record itself. This nuanced perspective suggests that the impact of accepting non-uniformitarian events might vary depending on the specific form of understanding being pursued.

Motivation:

The Chicxulub impact serves as a powerful example of a non-uniformitarian event reshaping our understanding of the past. While it doesn't negate the value of uniformitarian principles, it does raise important questions about when and how to invoke non-uniformitarian explanations. Your paper's framework, with its emphasis on different forms of understanding, provides a unique lens for exploring these questions.

Specific Points to Address:

How should the acceptance of impacts influence the criteria we use to decide between uniformitarian and non-uniformitarian explanations, specifically within each of your four forms of understanding? Do you see these criteria differing across the different forms of understanding? For example, would the criteria for a causal explanation (understanding **why**) be different from the criteria for a descriptive understanding (understanding **what**)? **Does the acceptance of non-uniformitarian events push us towards a more probabilistic or Bayesian approach to evaluating explanations, where we weigh the likelihood of different scenarios based on the available evidence?** How does this relate to your point about avoiding “specious clarity” and embracing the inherent complexities of geohistory?

Background:

The historical tension between gradualism and catastrophism, as well as the more recent discussions of punctuated equilibria in evolutionary biology, all inform this question. Your paper's nuanced perspective on uniformitarianism offers a promising framework for navigating these complex issues and developing a more sophisticated approach to understanding Earth's history.