

Comment on H. Weiss’ review of “Is there evidence for a 4.2 ka B.P. event in the northern North Atlantic region?”

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In their manuscript, **Bradley and Bakke (2019)** compile marine and terrestrial records from the North Atlantic, north of 60° N, to discuss the existence or otherwise of an abrupt climatic change around 4.2 ka BP across this extensive region. Their discussion is mainly based on data which do not conform to that expected of such an abrupt event. According to Weiss, as the *confirming evidences* of an abrupt climatic change are not cited in the manuscript, their article therefore “does not approach the consensual standards for science publication”.

While confirming evidences might at first appear to strengthen a hypothesis, we believe that deeper discussions that test the inherent robustness of any theory should embrace counter-evidence and address antithetical points of view. A “good” scientific model should explain all existing observations, and it must rule out certain things, i.e. it must be prohibitive (**Popper, 1963; Hawking and Mlodinow, 2010**). In the geological sciences, dating inaccuracies, measurement errors, dependency of proxy data on different processes, and/or inappropriate interpretations of proxy data can all be problematic

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when seeking conclusive evidence. The problematic nature of such data means that one can lightly dismiss any non-confirming studies when they arise from such false auxiliary assumptions. However, the same reasoning can also be applied to the supporting evidence itself (cf. [Berkelhammer et al., 2013](#); [Kathayat et al., 2018](#)).

As [Popper \(1963\)](#) stated, obtaining confirmations of a theory is easy, if one looks for it. Therefore, the idea that to strengthen the scientific status of a theory one should list further confirmatory evidence is, for Popper, merely an illusion. It is our view that discussions on the spatial coverage of the “4.2 ka BP event” must address the contradictory examples and even test “confirming” evidences if its robustness as a hypothesis is to be accepted. By doing so we may then modify the theory in a nuanced manner that incorporates the physical basis behind it or, potentially, even refuse it altogether. Again, as [Popper \(1963, p. 48\)](#) states: “A theory which is not refutable by any conceivable event is non-scientific. Irrefutability is not a virtue of a theory (as people often think) but a vice.”

References

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