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# Reply to the Discussion of “The ‘lost’ islands of Cardigan Bay, Wales, UK: insights into the post-glacial evolution of some Celtic coasts of northwest Europe”

by Catherine Delano-Smith, Phil Bradford, and William Shannon<sup>1</sup>

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## REPLY

Delano-Smith *et al.* (2022) provide a useful discussion concerning the use of the Gough Map and associated dating in response to the paper by Haslett and Willis (2022), and their views are informative and welcomed. The opportunity to provide further comment is also welcomed and it is hoped that this Reply addresses points raised and will be of benefit to the reader in further evaluating the research.

The study by Haslett and Willis (2022) was prompted by the depiction on the medieval Gough Map of two apparently ‘lost’ islands in Cardigan Bay (*Bae Ceredigion* in Welsh) lying offshore the coast of Ceredigion in Wales, UK (see fig. 1 of Haslett and Willis 2022 for locations mentioned herein). Therefore, the “starting point” for the study was not “medieval Welsh folklore about these islands” as stated by Delano-Smith *et al.* (2022, p. 261). Celtic literature and folklore are subsequently considered under geomorphological sources but Haslett and Willis (2022) do not present Celtic literature or folklore specifically about ‘islands’ in Cardigan Bay but rather a lowland. Furthermore, to clarify, Haslett and Willis (2022) do not claim “to ‘prove’ the existence of ‘lost’ islands” (Delano-Smith *et al.* 2022, p. 264) but through an examination of historical sources, physical aspects, and geomorphological sources conclude that their existence is considered plausible. Through such investigation, Haslett and Willis (2022) present a preliminary post-glacial coastal evolution model to provide a hypothetical framework which may be tested and evaluated through further research (e.g., Haslett and Willis, in press).

Scholarly literature concerning the Gough Map, as mentioned by Delano-Smith *et al.* (2022), presents a diverse

range of conclusions. Whilst prefacing their introduction to sources with a general note of caution, Haslett and Willis (2022) present examples, not in support of any conclusions of their own but as a prerequisite for embarking on the study in providing at the outset a level of reassurance that suggests the islands depicted on the Gough Map merit further consideration. However, Delano-Smith *et al.* (2022) provide a welcome clarification to the mistake that the Gough Map is not the earliest known map of Great Britain (Haslett and Willis 2022; National Library of Scotland 2022) but rather is more correctly described, for example, as the “earliest known surviving map of Britain drawn on a separate sheet” (Delano-Smith *et al.* 2017, p. 3) and the “the earliest map to show Britain in recognizable form” (Nurse 2022, p. 50).

The possibility that islands once existed in Cardigan Bay, as depicted on the Gough Map, prompted Haslett and Willis (2022) to reconsider Ptolemy’s coordinates as corrected by North (1957). The coordinate for the mouth of the River Teifi (*Afon Teifi*) at the southern end of Cardigan Bay is near its present-day location. A geomorphological explanation for an unchanged position is possible in that a radiocarbon date of 9539–10 154 cal. BP suggests that the Trawling Grounds bathymetric feature offshore of the river mouth may have been open to marine conditions and possibly a seaway for several thousand years, which may conceivably have been accessible to early seafarers (see fig. 4 of Haslett and Willis 2022). Northward along the coast, however, the next coordinate, for the mouth of the River Ystwyth (*Afon Ystwyth*), lies some 8 miles (ca. 13 km) west of the present-day location of the river mouth. While fully appreciating the comments of Delano-Smith *et al.* (2022), the depiction of offshore islands on the Gough Map appears consistent with

<sup>1</sup>Appears in Atlantic Geoscience, 58, pp. 261–266: this issue

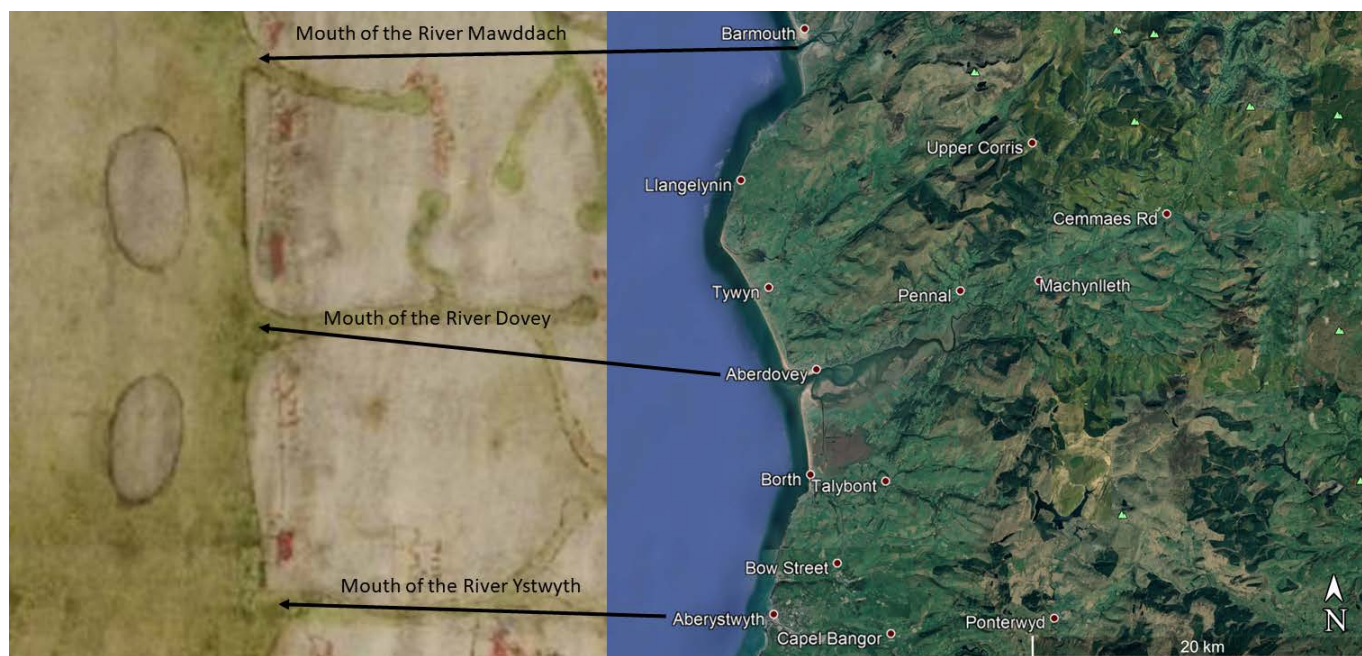
Ptolemy's coordinates and it is based on these two strands of independent evidence taken together that Haslett and Willis (2022), perhaps not unreasonably, consider the implications for coastal evolution.

Delano-Smith *et al.* (2022) state that “the Gough Map is not a scale map” (p. 263) and, indeed, Haslett and Willis (2022) acknowledge this. However, the configuration of the middle section of the north-south orientated coast of Cardigan Bay, when compared with the present-day coastline, appears similar overall (Fig. 1) with the main exceptions that, relative to the position of mouths of the Rivers Ystwyth and Mawddach (*Afon Mawddach*), the mouth of the River Dovey (*Afon Dyfi*) is positioned north of its present-day location and, of course, that two islands are depicted lying offshore which are not present today. In describing these islands, as depicted on the Gough Map, Haslett and Willis (2022) provide measurements relative to the length of coastal segments immediately adjacent to each island and strongly advise that “these measurements must be viewed with extreme caution” (p. 135). Notwithstanding this caveat, given the overall similarity between the Gough Map and the present-day configuration of this part of the Cardigan Bay coastline, it may not be unreasonable to attempt illustrative measurements of physical features as part of a geographical description.

In relation to the wider Cardigan Bay, Bower (2015) considered that the absence of the overall embayed configuration of Cardigan Bay may be attributable to poor

combination of separate ‘surveys’ used to construct the Gough Map. Based on this view, Haslett and Willis (2022) considered that “the lack of curvature of Cardigan Bay on the Gough Map does not cast significant doubt in itself on the distinct occurrence of the two ‘lost’ islands” (p. 133) because the lack of curvature may be due to the “poor combination of three regional surveys” rather than, necessarily, the accuracy of individual ‘surveys’ themselves, suggesting that local configuration and feature assemblages may be in places more reliable. Indeed, Bower's (2015) evidence suggests that such separate ‘surveys’ “were individually more accurate than the resultant map of England and Wales overall” (p. 145).

With regard to describing the location of the islands, Delano-Smith *et al.* (2022) state that “the fifty or so islands [depicted on the Gough Map] surrounding Britain are arbitrarily distributed” (p. 264). This may be the case but the location of the two islands considered by Haslett and Willis (2022) in Cardigan Bay do not appear to be arbitrarily positioned because they occur offshore of segments of coast lying between river outlets and the channel between the islands lies directly seaward of the mouth of the River Dovey. If these islands had been arbitrarily distributed then one or more islands may have been expected to have been drafted obscuring a river mouth and that they may not have been drafted each at a similar distance from the shore. Furthermore, as noted in the Haslett and Willis (2022) study, the islands depicted on the Gough Map are approximately coincident with bathymetric highs and the



**Figure 1.** A comparison of the Gough Map (extract left) and the present-day coastline of the middle section of Cardigan Bay (reproduced under the Bodleian Library's, Oxford, and Google Earth's terms of use).

occurrence of accumulations of coarse boulders and gravel on the seabed known as sarns. As suggested by Delano-Smith *et al.* (2022), it may be that these islands represent grossly mislocated islets, such as Gwylan and/or St Tudwal's Islands; however, the position of the 'lost' islands is consistent with, and explainable by, the geology, bathymetry, and physical processes as considered by Haslett and Willis (2022) in the coastal evolution model they present.

Lastly, with regards to geomythological aspects, the view of Delano-Smith *et al.* (2022) "that no reference is made on the Gough Map to the lost lowland of Cantre'r Gwaelod" (p. 264) does not contradict Haslett and Willis (2022), who do not claim otherwise. However, the reference to Cantre'r Gwaelod, or Maes Gwyddno, in Celtic literature and folklore lends support to a general notion that a landscape may have previously existed seaward of parts of the present-day coastline in Cardigan Bay, an idea which is not at odds with the possible occurrence of islands as depicted on the Gough Map.

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