

“a farmer”: an early scientific explanation of continental drift

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ROSENBAUM, M.S.¹ and TORRENS, H.S. (2017)². “a farmer”: an early scientific explanation of continental drift. *Proceedings of the Shropshire Geological Society*, **18**, 1–4. The anonymous review in *British Critic* (1804) indicated that the book by “a farmer” included a detailed description of Whitcliffe, the common land facing Ludlow and site of quarrying for building stone since medieval times (Torrens, 2008). After many years of searching, a single copy has been located, in Edinburgh. Not only does the original indicates an extant interest in the geology of South Shropshire by the beginning of the 19th Century, some 30 years before Murchison’s first visit, but also provides an early scientific explanation of continental drift.

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INTRODUCTION

Through a lifelong interest in the geology of Shropshire and the Marches, it has long been felt that the 1804 review of the paper by “a farmer” might be referring to one of the earliest accounts of the geology of the area (Torrens, 2007). This would have sat alongside the Shropshire geology writings of Cardington-based Robert Townson, Arthur Aikin, founding member of the Geological Society (of London), and members of the Lunar Society: John Whitehurst and Erasmus Darwin.

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REDISCOVERY

Until recently it had been feared that the original paper had been long lost and the only surviving account was that *British Critic* review. However, with the diligence of Wendy Cawthorne, librarian at the Geological Society of London, a reference to the full paper was discovered in a scan by Cornell University of an original held by Cornell University Library of the 1890 catalogue of the Crawford Library of the Royal Observatory, Edinburgh [*and not scanned by the University of Berkeley, California as reported in Torrens*

(2009)]. Enquiries to the librarian, Karen Moran, procured a photocopy of the full paper, the only known surviving copy (Torrens, 2009). This has been reproduced in facsimile in the *Proceedings of the Shropshire Geological Society* (2017).

COMMENTARY

The book does indeed commence with, for the time, a good account of what are now referred to as Upper Silurian siltstones of marine origin, as shown by their shelly fauna, largely produced as shallow water storm facies. The violence of the environment impressed “a farmer” and he uses this to describe a turbulent origin for the Earth’s crust linked to the Noah’n flood. Whereas *Thoughts on the Formation of the Earth* otherwise lacks geological detail, and theoretical extrapolation abounds, the single map within this book clearly draws attention to the shape of the land masses either side of the Atlantic Ocean. Within the text there are several references to geological features that bear on the distribution of features one side of the ocean compared to the other.

In his/her Preface, “a farmer” writes that the only book that they had read on the subject was an abridged translation of Buffon’s work, presumably the multi-volume *Historie Naturelle*, and makes no reference to others with whom they might have discussed their theories of the formation of the Earth. Indeed, within the Preface the author explicitly states that they had no-one “sufficiently skilled in philosophy and chemistry” with which to discuss his/her theories. The history of translation

is complex (Loveland, 2004), and we do not know which version “a farmer” referred to.

The early notion of continental drift prior to 1900 has been succinctly summarised by Nicolaas Rupke (1970), who concludes that earlier writers expressed their ideas as catastrophic events, short-lived and not going on at present. Interestingly Buffon is included in this discourse, although the fit of Africa and South America is denied (Buffon, 1749) and it was conjectured that the Atlantic might have been formed by the subsidence of an

intervening landmass, Atlantis (Buffon, 1778). However, “a farmer” devotes the whole of chapter three to the manner by which these continents have come to have their current configuration, explicitly stating (p.18) “that the American continent was torn from this [united mass]” and refers to the configuration portrayed in their single map sheet (an enlarged version of which is reproduced here as Figure 1).

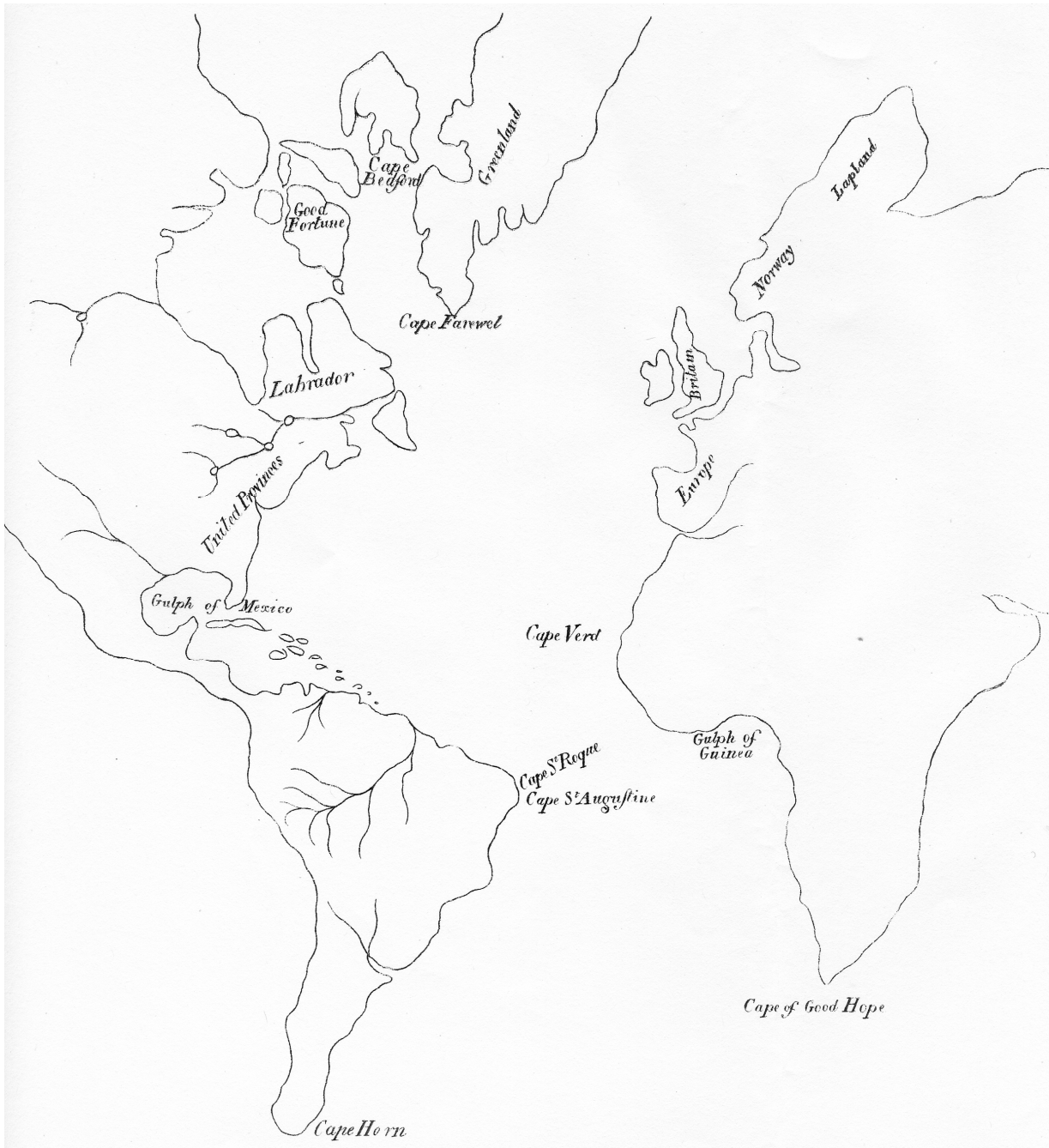


Figure 1. Enlarged version of the map published by A. Farmer (1802), in which he writes “that the American continent was torn from this [united mass]”.

The explanation given for a mechanism is that such movement of continents is restoring the equilibrium disturbed during earlier raising the height of portions of the land, driven by (p.19) "centrifugal force". In the accompanying footnote the author contemplates the forces causing "fluid matter to rush violently through the rents to a great length before it crystallised". Could they possibly be referring to the lines of volcanic terrain now known to define plate boundaries? Or was this just reference to Hutton's concepts for the creation of igneous rocks? The author goes on (p.20) to conject that beneath the surface crust (of the Earth) "all within is now in a state of fluidity . . . and that all this incrustrated mass might still be subject to some motion". This goes some way beyond Rupke's assertion of contemporary ideas being confined to catastrophic events. However, "a farmer" does go on to link this to Noah's flood, yet is troubled by the apparently anomalous records in the stratigraphy.

The author uses Chapter 4 to draw on their observations made in North Wales to discuss whether there could be reconciliation between the apparently complex sequence of strata, their structural disturbance, and the configuration of the landscape. In particular, fractures, wide fissures, and mineral veins made a strong impression. The apparent burial of plant remains utilises an interesting concept by invoking the occurrence of landslips. Potentially intricate stratigraphic successions are thereby explained through repeated landslipping events.

"A farmer" appears to have moderated his ideas of an extensive flood by invoking other processes to explain the observed sequence of sediments and their relationship to crystallisation of the Earth's crust and its structure. The geographical distribution of the continents across the Atlantic is seen as an ongoing process, driven by forces generated by rotation of the planet causing mountain chains to rise, subsequent landslipping and erosion being responsible for local complexities and the reconfiguration of the landscape.

The Preface makes clear that "a farmer" was inspired by the geology they observed in North Wales. Cader Idris is clearly one mountain that brought inspiration given the citation on the title page. However, the concepts had largely already been developed prior to this excursion. To what

extent these were formulated in South Shropshire, as suggested by the detailed description of Ludlow's geology in Chapter 1, or had been developed prior to that time when the author lived in Devon, is not clear from the text.

MYSTERY

The identity of "a farmer" is still a mystery. According to the book (Farmer, 1802), he/she was writing from North Wales, inspired by the nature of the ground in the mountainous regions of that country, yet commenced the book with a detailed account of the rocks and fossils of Whitcliffe, just west of Ludlow. This implies a personal knowledge of the area and, from a date point of view, he/she would have been a contemporary of Arthur Aikin, who also travelled around North Wales, in 1796 with his younger brother, Charles Aikin, and Charles Kinder (Aikin, 1797). It is tempting to consider if "a farmer" who wrote this account might be an Aikin, but the Aikins were medics and scientists, not of the land, were widely read, and published the account of North Wales just a year after the journey, and in Arthur's own name. Furthermore, Aikin's geological descriptions are detailed, comprehensive and apparently accurate, with little in the way of abstraction or theoretical extrapolation.

The footnote on page 7 states that "a farmer" spent the greatest part of his/her life in the county of Devon, referring to Dartmoor granite and its associated ores, "and never travelling much". Furthermore, the single reference to a book, by Buffon, read late in the formulation of the theory, is at odds with the more comprehensive academic approach by the Aikin's.

Something is known of the publisher, Philip Sandford (1757-1810?), a well-known bookseller, printer and publisher in Shrewsbury, described in detail by Lloyd (1935). However, no ledgers or correspondence has been discovered which casts light on the identity of "a farmer". The title page of the book states "Shrewsbury: printed for the author by P. Sandford, bookseller, and sold by Messrs Richardson, Royal Exchange, London. 1802".

CONCLUSIONS

Thoughts on the Formation of the Earth provides us with a fascinating insight to the thinking about the origin of the Earth at the turn of the 18th and 19th Centuries, some decades prior to the establishment of geology as a science. That “a farmer” was able to conceive and publish an account of that origin apparently in isolation is worthy, but remarkable is the resolution of stratigraphical detail with the influence of global movements of the continents, and that these are on-going, over a century before the writings of Taylor and Wegener.

ACKNOWLEDGEMENTS

Our grateful thanks go to Wendy Cawthorne, librarian at the Geological Society of London, for having located the scanned catalogue which led to retrieval of a copy of A Farmer’s full paper, kindly supplied by Karen Moran, the librarian of the Crawford Library of the Royal Observatory, Edinburgh

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ISSN 1750-855x