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The origin of the Parallel Roads of Glen Roy: a review of 19th Century research

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ABSTRACT

This paper summarises the 19th Century research conducted in the Lochaber area and which sought to answer the enigma of the Parallel Roads of Glen Roy. This should be seen as an introduction to the main theories that were developed by a number of scientists, including Darwin, Agassiz and Jamieson. They considered the landforms to be a product of either lacustrine, marine or glaciolacustrine processes, the latter of which proposed by Jamieson, became the accepted explanation by the end of the century.

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1. Introduction

In the 18th century, the "Parallel Roads of Glen Roy" became a celebrated feature of the remote Lochaber region. They were called "Roads" because they were initially thought to be ancient hunting roads cut along hillsides that were formerly forested. But by the early 19th century most visitors agreed that they must have a natural and probably pre-human origin. This review describes, in chronological order, the development of the key scientific ideas and debates during the 19th century that form the fundamental basis for our modern understanding of the origin of the Roads (Table 1). (For an account of the early 19th-century geological debates in which Glen Roy was involved, see Rudwick, 2008, esp. pp. 483–539.)

For the purposes of this review the 19th Century anglicised place names have been used in the Figures and the text (Fig. 1). The roads in Glen Roy are referred to here as R1 (Road 1), R2 (Road 2) and R3 (Road 3), which are the equivalent of the 350 m, 325 m and 260 m shorelines respectively. (For the remainder of the articles in this special issue the Roads will be referred to by the modern convention of the predominant altitude above sea level at which the shoreline is observed.) The single shoreline in Glen Spean is referred to as Road S and is equivalent to the 260 m shoreline and of the same altitude as Road 3 (when reference is to both Glens, it is

(*Glen Gluoy*) is referred to as Road G. The cols that controlled the height of the lake systems are referred to as Col S for the Pattack/ Mashie col (*Pass of Muckul*), Col R1 for the col between the Roy and the Spey, and Col R2 for the col between Glean Glas Dhoire (*Glen Glaster*) and Roughburn.

termed Road R3/S). The single shoreline, at 355 m, in Glen Gloy

2. MacCulloch and Lauder

John MacCulloch, a professional geologist based in London, and Thomas Dick Lauder, a Scottish amateur geologist, visited Lochaber independently between 1815 and 1817, surveyed the Roads in detail, and came to similar conclusions, which they published in 1817 and 1821 respectively. Both interpreted the Roads as lake beaches formed at some remote time when Glen Roy and certain adjacent valleys were filled with freshwater lakes at three or four successively lower levels (Fig. 2). But this generated the problem of explaining the absence of any obvious trace of the barriers that must have impounded these lakes, most probably situated where the Roads fade away at the mouths of the valleys. MacCulloch (1817) considered briefly the alternative possibility that the Roads were sea beaches, dating from a time of much higher sea level; but he rejected it because the Roads were confined to these specific valleys, and because there was no trace of marine deposits such as seashells anywhere on the terraces.

Lauder (1821) proposed an interpretation similar to MacCulloch's, but improved it on three important points through the more accurate instrumental levelling conducted by his surveyor. This

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 Table 1

 A summary of the main protagonists that developed theories concerning the Parallel Roads of Glen Roy and other prominent geologists of the time.

Name	Life	Short biography
John MacCulloch	1773–1835	Scottish geologist based in London; did extensive fieldwork in Scotland; in Lochaber in 1815; his paper on Roads read at Geological Society 1817, published in <i>Transactions of the Geological Society</i> 1817.
Thomas Dick Lauder	1784–1848	Scottish country gentleman (baronet from 1820), historical novelist, amateur geologist; did fieldwork in Lochaber 1816 and 1817; his paper on Roads read at Royal Society of Edinburgh.
William Buckland	1784–1856	English geologist based at Oxford, prominent from 1819 as a "diluvial" theorist; studied Alpine glaciers with Agassiz in 1838; undertook fieldwork in the Highlands (including Lochaber) with Agassiz in 1840, and was converted to the glacial theory as applied to Britain.
Charles Lyell	1797–1875	Anglo-Scottish geologist based in London; author of <i>Principles of Geology</i> (first ed. 1830–33), rejecting any diluvial theory; was converted to Agassiz's glacial theory after fieldwork in Forfarshire in 1840, but soon retreated to a much weaker version.
David Milne	1805–1890	Scottish country gentleman, lawyer, amateur geologist; did fieldwork in Lochaber 1845 and 1846, his paper read at Royal Society of Edinburgh and published in its <i>Transactions</i> 1847.
Louis Agassiz	1807–1873	Swiss naturalist based at Neuchâtel; expert on fossil fish; proposed geologically recent "Ice Age" [a Pleistocene "Snowball Earth"] Neuchâtel 1837, and expounded it at Geological Society (London) and the British Association (in Glasgow) 1840; fieldwork in Highlands (including Lochaber) with Buckland 1840; followed by papers read at Geological Society and elsewhere, from 1840, applying glacial theory to Britain.
Charles Darwin	1809–1882	English geologist; unofficial naturalist on <i>Beagle</i> 1831–36; based in London 1837–42, thereafter in Kent; papers on South America and global tectonic theory read at Geological Society 1837–38 [compiled private notebooks on speciation and "Man" 1837–39]; did fieldwork in Lochaber 1838, his paper on Roads read at Royal Society (London) 1839, published in <i>Philosophical Transactions of the Royal Society</i> 1839; this was his first major scientific paper and contributed to him becoming FRS.
Thomas Jamieson	1829–1913	Scottish agricultural scientist, amateur geologist; undertook fieldwork in Lochaber (suggested by Lyell and Darwin) 1861 and 1862; his paper on Roads read at Geological Society 1863, published in <i>Quarterly Journal of the Geological Society</i> 1863.

survey showed, first, that the one and only definite Road in Glen Gloy (Road G) is exactly level with the pass or col (Col G) at its head; this could therefore have been the outlet of a putative "Loch Gloy", overflowing into the adjacent Glen Roy, where the

highest of three Roads (Road R1) is slightly but distinctly lower (rather than being at the same level as Road G, as MacCulloch thought). Second, that this Road R1 in turn is on a level with the pass or col (Col R1) at the head of Glen Roy, which therefore

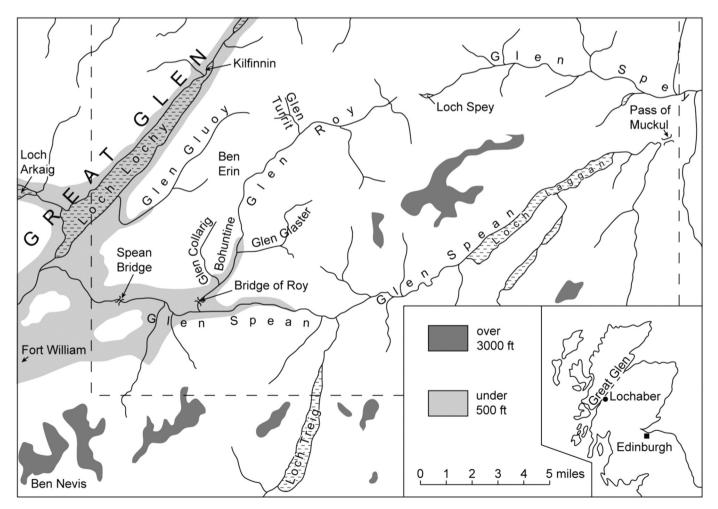


Fig. 1. Outline topographical map of Glen Roy and Glen Spean, with the anglicised place names used in the 19th Century. Adapted from Rudwick (1974).

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