
The geology of Eigg

A description of the geology of Eigg for all those interested in the landscape and natural history of the Hebrides, with suggested excursions.

by John D Hudson, Angus D Miller and Ann Allwright

2nd edition 2016

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(Frontispiece) A view of the north coast of Eigg showing the stony beach and cliffs of Sgor Sgaileach. Hugh Miller discovered plesiosaur bones in pebbles of red limestone here in 1844.

(Front cover) The Sgurr of Eigg viewed from the ferry arriving at Galmisdale.

(Rear cover) Sandstone with concretions near Laig Bay, with Rum in the background.

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Foreword to the second edition

Eigg is a small island, but it displays a remarkable variety of geology in a beautiful setting, in a way that is readily appreciated by those without any special knowledge of geology. There is an inspiring precedent in the visit of that self-taught polymath, Hugh Miller, in the 1840s. We have quoted liberally from his vivid writings. We have led many field parties to the island, separately and together. The excursions described build on this experience. A set of 'postcard' maps, included here and available from the craft shop, and clearly marked paths, make exploring the island much easier than it used to be.

The Geology of Eigg was written in 2003 for the Isle of Eigg Heritage Trust and was sold in the island craft shop. It proved gratifyingly popular with visitors; the first printing of 500 copies was soon sold out, and the book was reprinted. That printing too was exhausted in 2014, giving us the opportunity to write this revision, including more colour illustrations and updates of the geological story in the light of recent research. Although the original edition was reviewed in *The Edinburgh Geologist*, following a field excursion by the Edinburgh Geological Society, it was not sold beyond the island. This edition was published by the Edinburgh Geological Society with the collaboration of the Isle of Eigg Heritage Trust, which we hope will give it a wider circulation.

Because of the publicity engendered by the community buy-out in 1997, and the subsequent development of many projects including the first completely wind-, water- and sun-powered electricity grid in the world, Eigg has gone from obscurity to being one of the best-documented of Scottish islands. It is an interesting and hopeful place, not only but not least for its geology.

Wherever you go, we trust that you will enjoy your visit.

Eigg timescale inside back cover

Acknowledgements

We have geologised on Eigg with too many people to mention them all individually. We must acknowledge Henry Emeleus, who was Ann Allwright's research supervisor and the principal author of the Geological Survey's map and memoir; these will form the basis of all future research.

John Hudson acknowledges especially David Wright, his companion on an extremely wet first research visit in 1956, and his former research students Jim Harris, Jim Marshall, Julian Andrews, Mark Wilkinson and Matthew Wakefield, who have gone on to careers in academia and industry but retain a love of the Hebrides. Their results are used in this guidebook.

Several people, especially Henry Emeleus, and Michael Taylor of the National Museums Scotland, kindly criticised earlier versions of the 1st edition. Henry Emeleus and Michael Branney provided much advice in revising the igneous sections for this edition, for which David Stephenson provided many helpful editorial suggestions. Production of this edition was greatly assisted by Debbie Rayner undertaking the layout, rescanning of several images by Brian McIntyre and proof-reading by Christine Thompson. We also thank our hosts for visits over the years, especially Dolly and the late Duncan Ferguson, Peggy and the late Donny Kirk, and Marie and Colin Carr. The excellent Glebe Barn Hostel and Outdoor Centre, started by Simon and Karen Helliwell and now passed on to Tamsin and Stuart McCarthy, has made Eigg far more accessible for groups.

Sources of illustrations

Photographs and drawings are by the authors except as follows:

(Figure 3): Based on maps of the British Geological Survey by permission IPR/25-11C.

(Figure 4): M Branney.

(Figure 5): Based on figure 55 in the Geological Survey memoir by permission IPR/25-11C.

(Figure 6): Brown, D S. (1981) The English Upper Jurassic Plesiosauroidea (Reptilia) and a review of the phylogeny and classification of the Plesiosauria. *Bulletin of the British Museum (Natural History)*, Volume 35 no. 4, figure 10.

(Figure 7): Martill, D M and Hudson, J D. (editors) (1991) *Field Guide to Fossils: No. 4 — Fossils of the Oxford Clay*. London: The Palaeontological Association, figure 10.1.

(Figure 10): P Boyd.

(Figure 11): Castell, C. (1975) *British Mesozoic fossils (Fifth edition)*. London: The British Museum (Natural History), plate 37, figure 1 and plate 41, figure 2.

(Figure 15): Redrawn by A. Dawn from a sketch by A Harker, figure 16 in Harker, A. (1908) *The Geology of the Small Isles of Inverness-shire*. Memoir of the Geological Survey of Great Britain, Sheet 60 (Scotland).

(Figure 18): David Stephenson.

(Figure 21): Based on figure 49 in the Geological Survey memoir by permission IPR/25-11C.

(Figure 24): Witham, H. (1833) *The internal structure of fossil vegetables*. Edinburgh, plate 15, figure 9.

(Figure 25): David Stephenson.

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(Figure 30): M Wilkinson.

(Figure 32): David Stephenson.

(Figure 37): Based on figure 48 in the Geological Survey memoir by permission IPR/25-11C. The route maps were designed by Ben Cormack for the Isle of Eigg Heritage Trust.

Sources of further information

Further reading

Hugh Miller's description of his visits to Eigg has more human and literary interest than all the rest put together and, as the above account shows, contains remarkable scientific insight too:

Miller, H. (1858) *The cruise of the Betsey*. Edinburgh: Thomas Constable and Co. A facsimile reprint, with an introduction and additional notes by Michael Taylor and preface by T.C. Smout was published by National Museums of Scotland, Edinburgh in 2003. ISBN 1-901663-54-X (paperback).

A recent biography by Michael Taylor puts Miller's life in a modern context: Taylor, M A. (2007) *Hugh Miller — stonemason, geologist, writer*. Edinburgh: NMS Enterprises - Publishing Ltd. ISBN 978-1-905267-05-7.

Miller's bicentenary was marked in a series of essays, including one by John Hudson specifically about Eigg, and the collected papers were published as:

Borley, L. (editor) (2003) *Celebrating the life and times of Hugh Miller*. Cromarty: The Cromarty Arts Trust. ISBN 0-906265-33-9 (paperback). This book is now out of print but a pdf version is available from www.cromartyartstrust.org.uk/publications.asp.

The British Geological Survey's 1:50 000-scale map, and the accompanying memoir by Henry Emeleus and others, are indispensable to anybody seriously interested in the geology of Eigg; also Rum, Canna and Muck:

Emeleus, C H. (1997) [Geology of Rum and the adjacent islands](#). Memoir of the British Geological Survey, Sheet 60 (Scotland). London: The Stationary Office. ISBN 0-11-884517-9.

There is a clear and up-to-date account of Hebridean geology in:

Emeleus, C H and Bell, B R. (2005) [British regional geology: the Palaeogene volcanic districts of Scotland](#) (Fourth edition). Nottingham: British Geological Survey. ISBN 0-85272-519-1.

The modern understanding of the Sgurr of Eigg comes from: Brown, D J and Bell, B R. (2013) The emplacement of a large, chemically zoned, rheomorphic, lava-like ignimbrite: the Sgurr of Eigg Pitchstone, NW Scotland. *Journal of the Geological Society, London*, Volume 170, pages 753–767.

Organisations

The National Trust for Scotland runs the Hugh Miller Museum and Birthplace Cottage in the Black Isle town of Cromarty. The Museum has been in the care of the Trust since 1938.

<https://www.nts.org.uk/visit/places/hugh-millers-birthplace>.

The Friends of Hugh Miller is a registered charity that celebrates and promotes the legacy of Hugh Miller. The Friends group was founded by Martin Gostwick in 2006, supported by his wife, Frieda Gostwick. They saw the need to broaden public knowledge of the man, and provide support for the Museum. The group works in partnership with the Trust and its staff. <https://www.thefriendsofhughmiller.org.uk/>.

The group also runs the Discover Hugh Miller website— www.hughmiller.org.

The **Lochaber Geopark** includes Eigg and the rest of the small isles. The Geopark organise events, prepare leaflets and information boards and run a visitor centre in Fort William. Further information from <https://lochabergeopark.org.uk/>.

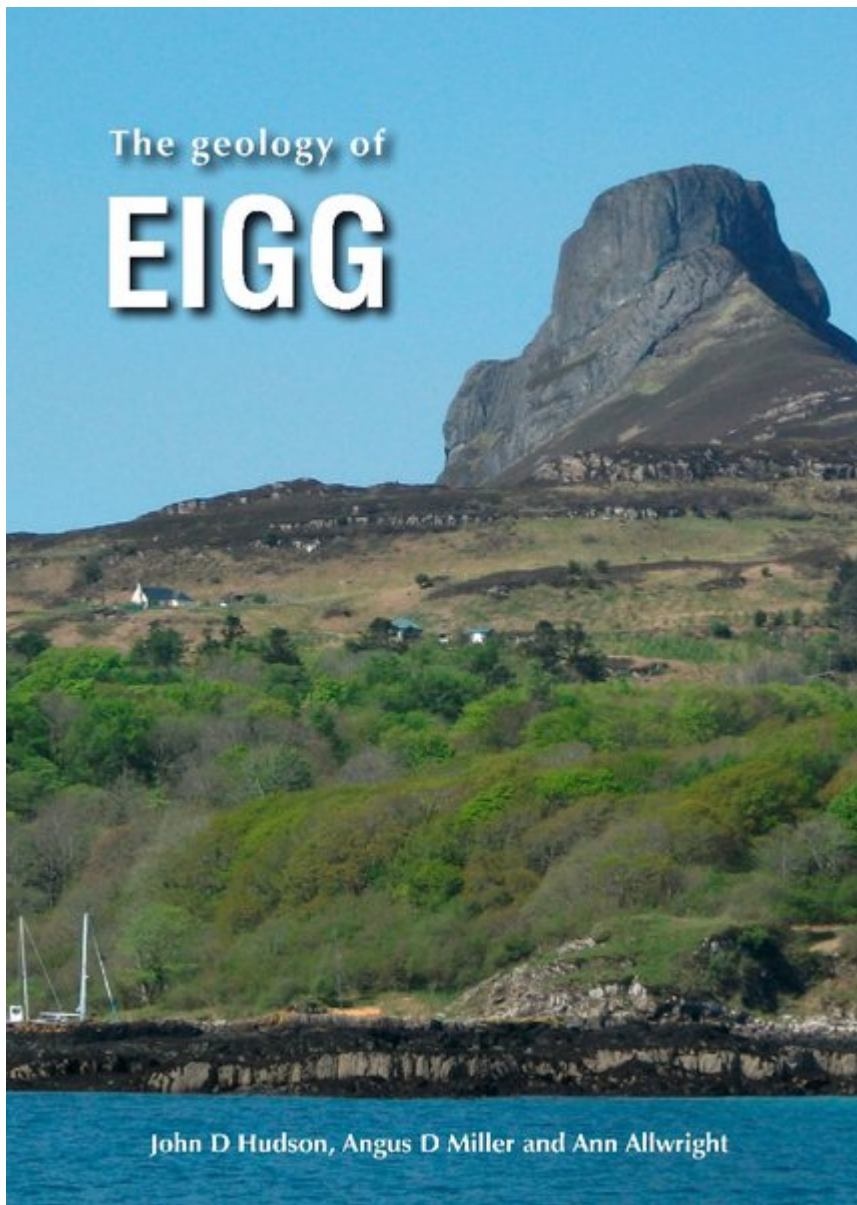
(Front cover) The Sgurr of Eigg viewed from the ferry arriving at Galmisdale.

(Rear cover) Sandstone with concretions near Laig Bay, with Rum in the background.

(Figure 42) Frontispiece. A view of the north coast of Eigg showing the stony beach and cliffs of Sgor Sgaileach. Hugh Miller discovered plesiosaur bones in pebbles of red limestone here in 1844.



Frontispiece A view of the north coast of Eigg showing the stony beach and cliffs of Sgor Sgaileach. Hugh Miller discovered plesiosaur bones in pebbles of red limestone here in 1844.



Front cover The Sgurr of Eigg viewed from the ferry arriving at Galmisdale.



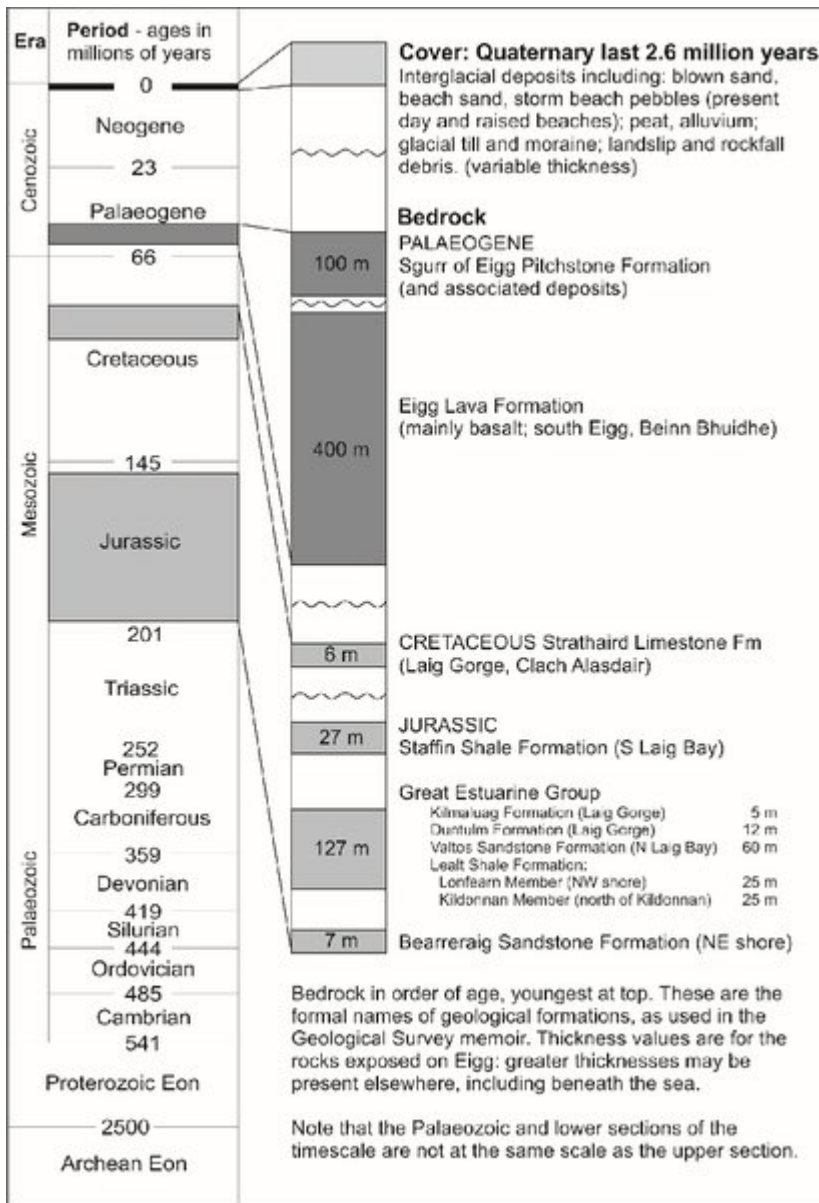
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Rear cover Sandstone with concretions near Laig Bay, with Rum in the background.



Geological timescale on Eigg.

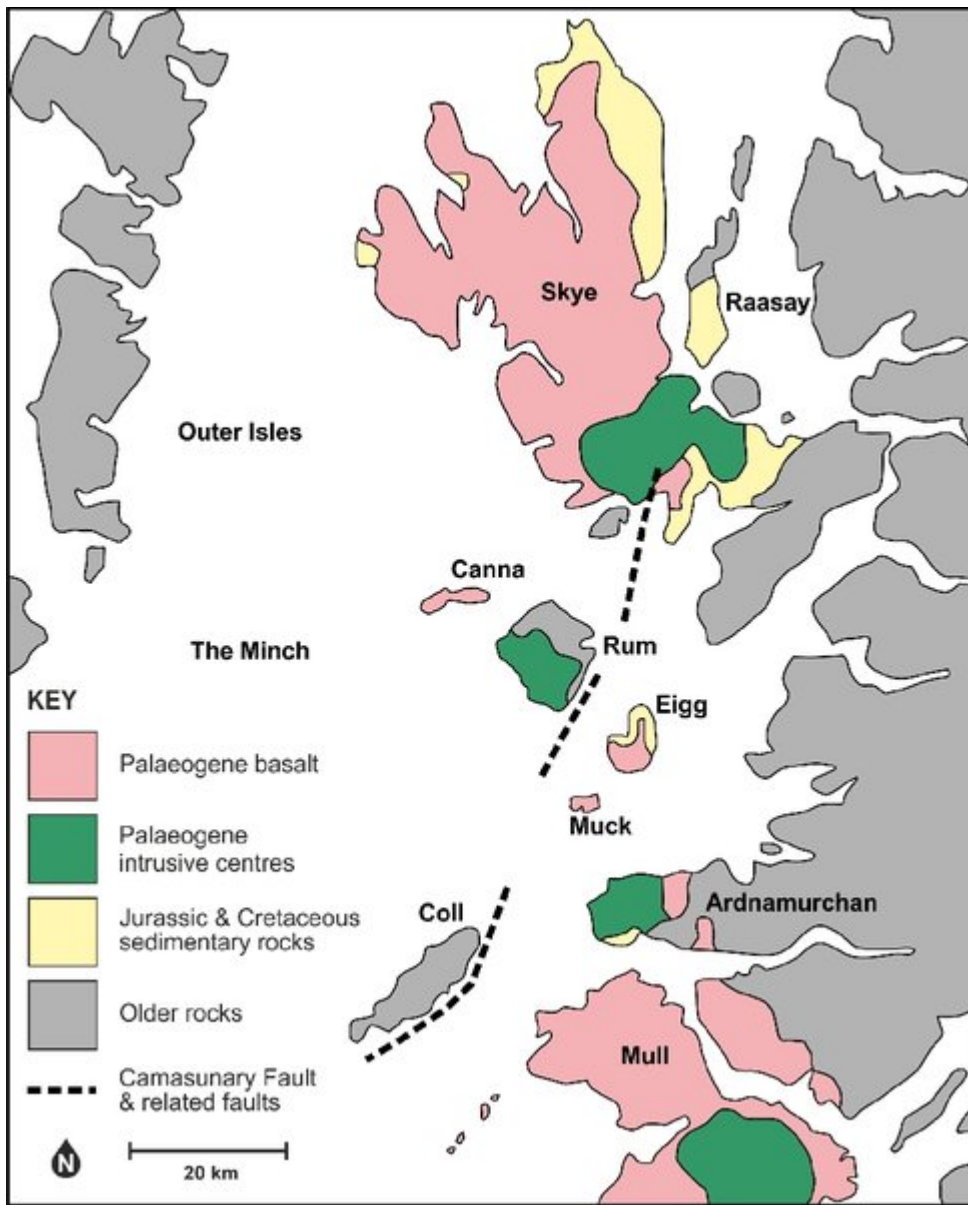


Figure 3 Eigg in the Hebrides. By permission IPR/25-11c— British Geological Survey.



Figure 4 Rum from the Sgurr ridge (Excursion 4).

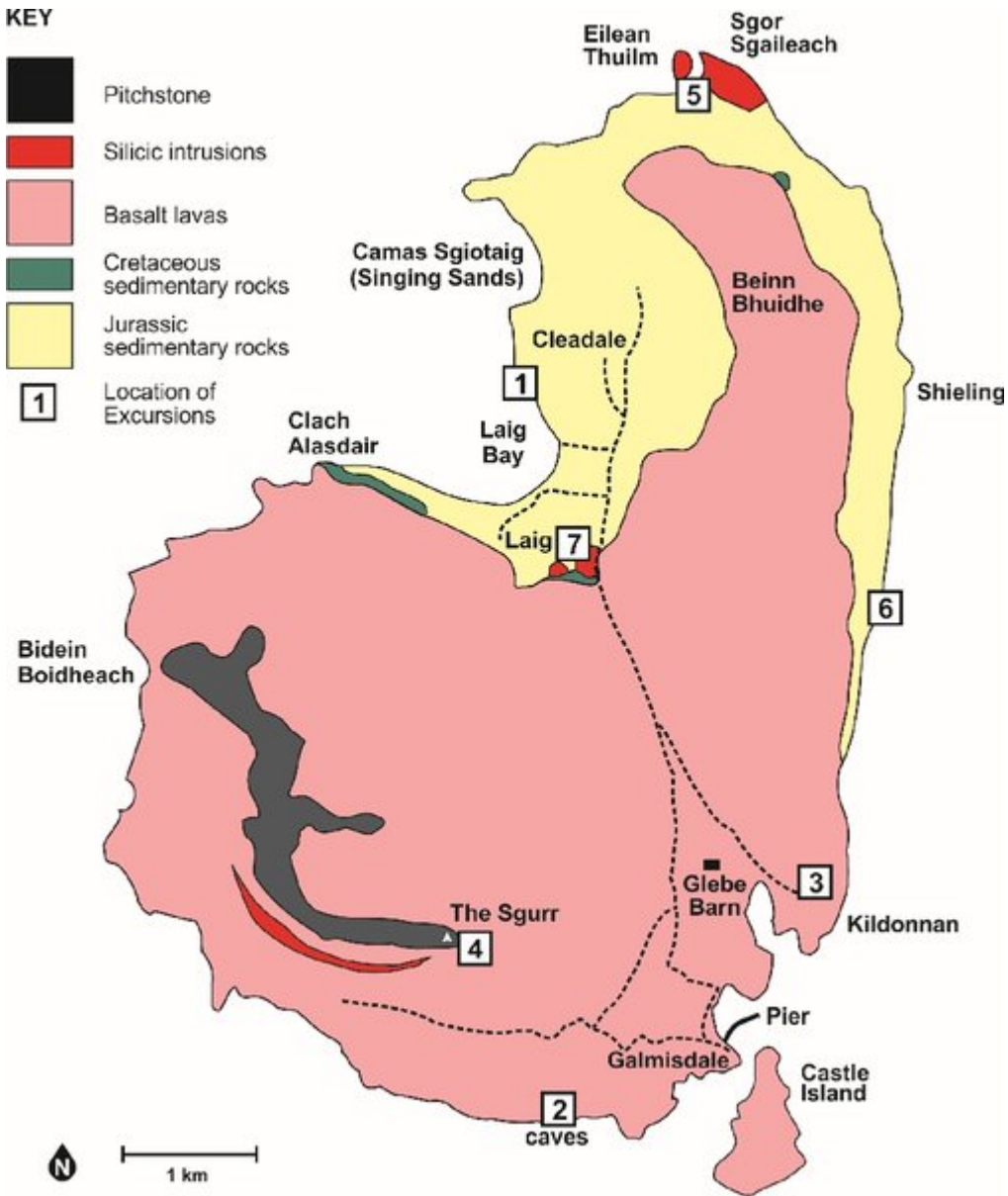


Figure 5 The geology of Eigg. Note that basalt dykes and sills are not shown. By permission IPR/25-11c — British Geological Survey.

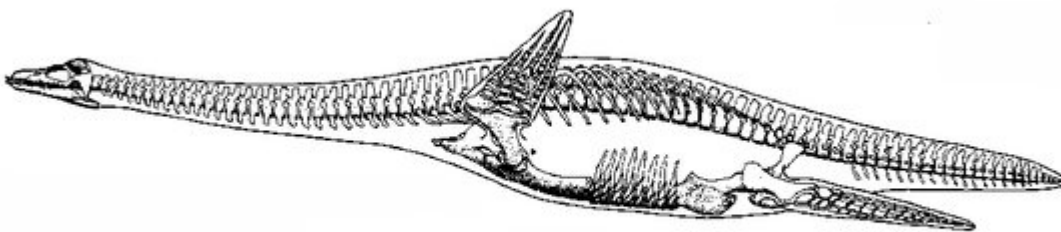


Figure 6 Plesiosaur skeleton.

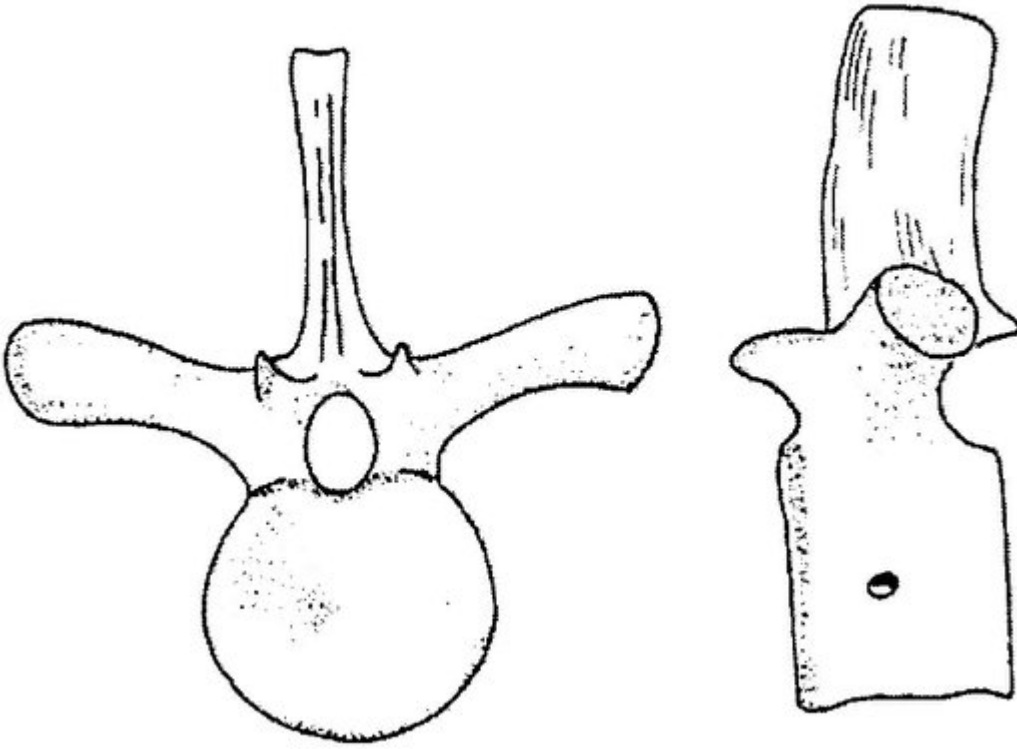


Figure 7 Plesiosaur vertebrae.



Figure 10 *Praeexogyra hebridica* (Excursion 7).

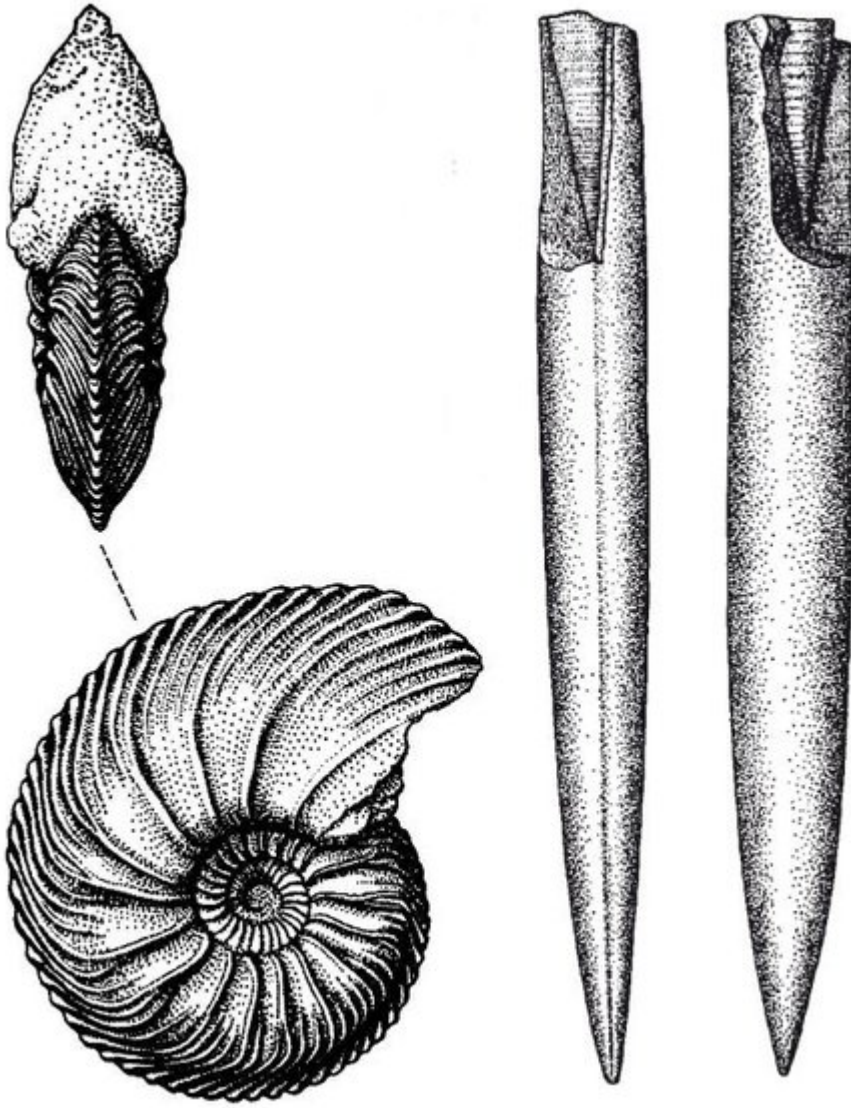


Figure 11 Examples of Jurassic ammonite (*Cardioceras*) and belemnite.



Figure 15 Sketch of Eigg showing trap topography.



Figure 18 Dyke intruding sandstone, near Camas Sgiotaig (Excursion 1).

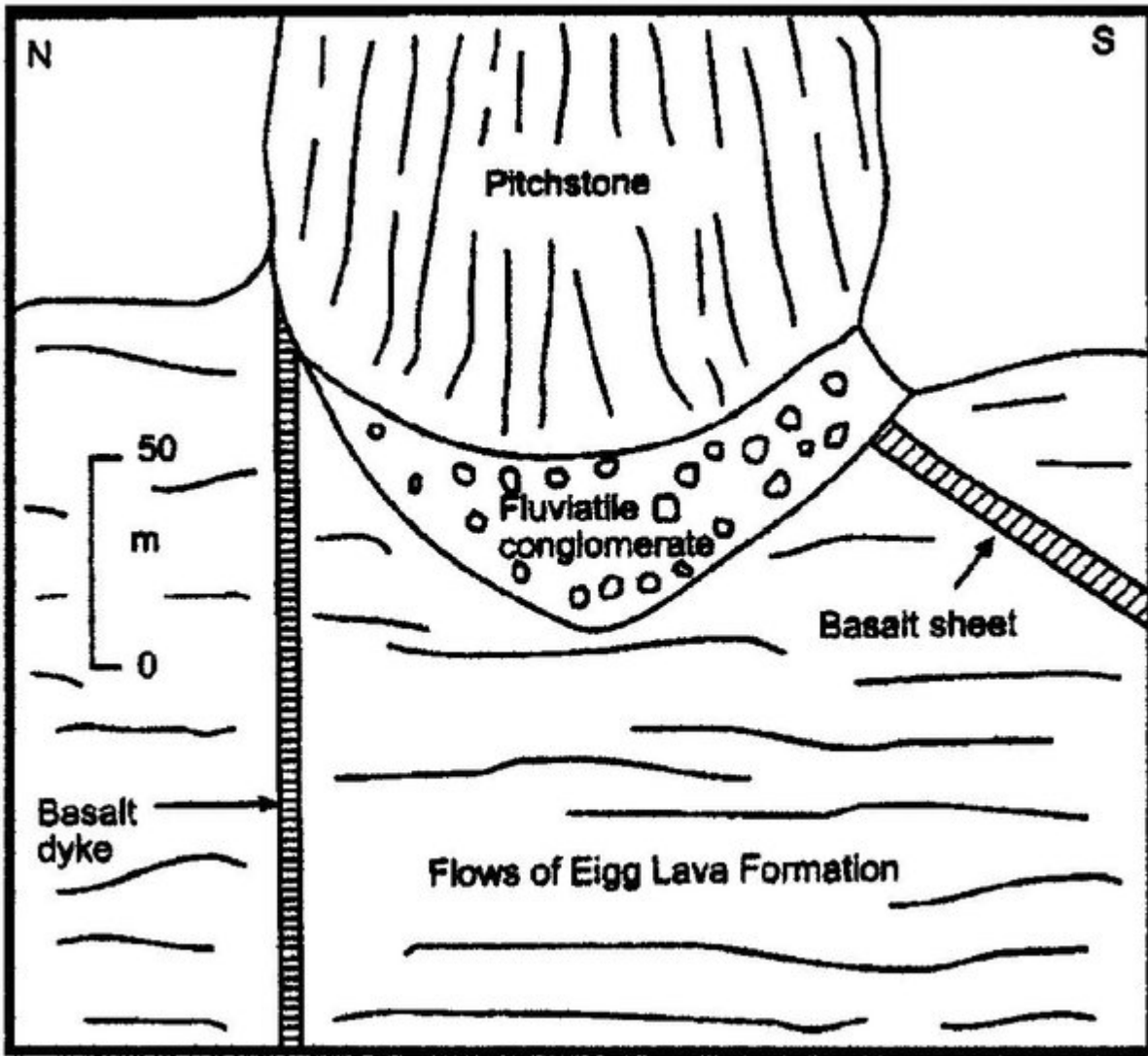


Figure 21 Sketch of cliffs at Bidein Boideach, showing conglomerate underneath the pitchstone. By permission IPR/25-11C – British Geological Survey.

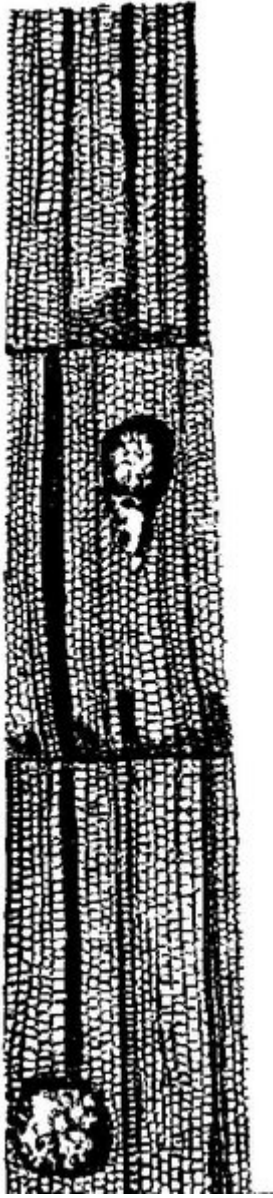


Figure 24 Thin section of *Pinites eiggensis*.



Figure 25 Kettle hole lochan near Laig farm (Excursion 1).

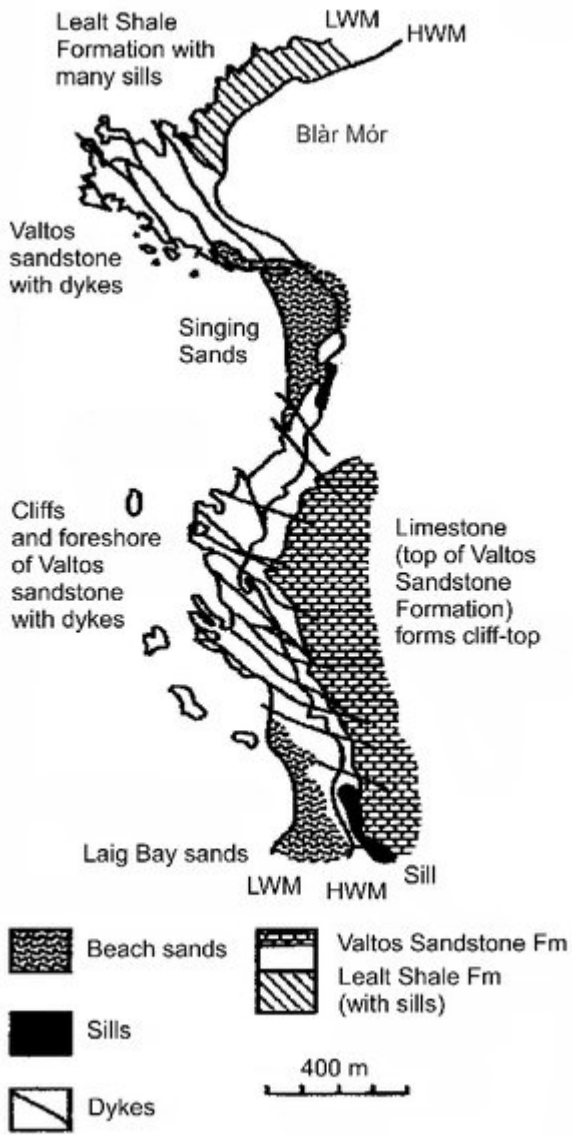


Figure 29 Sketch map showing Jurassic rocks, dykes, sills and beach sands, north-west Eigg. By permission IPR/25-11C – British Geological Survey.



Figure 30 Rum from inside a cave, Laig Bay.



Figure 32 Distinctive dyke with tabular feldspar crystals, on the foreshore in front of Massacre Cave.

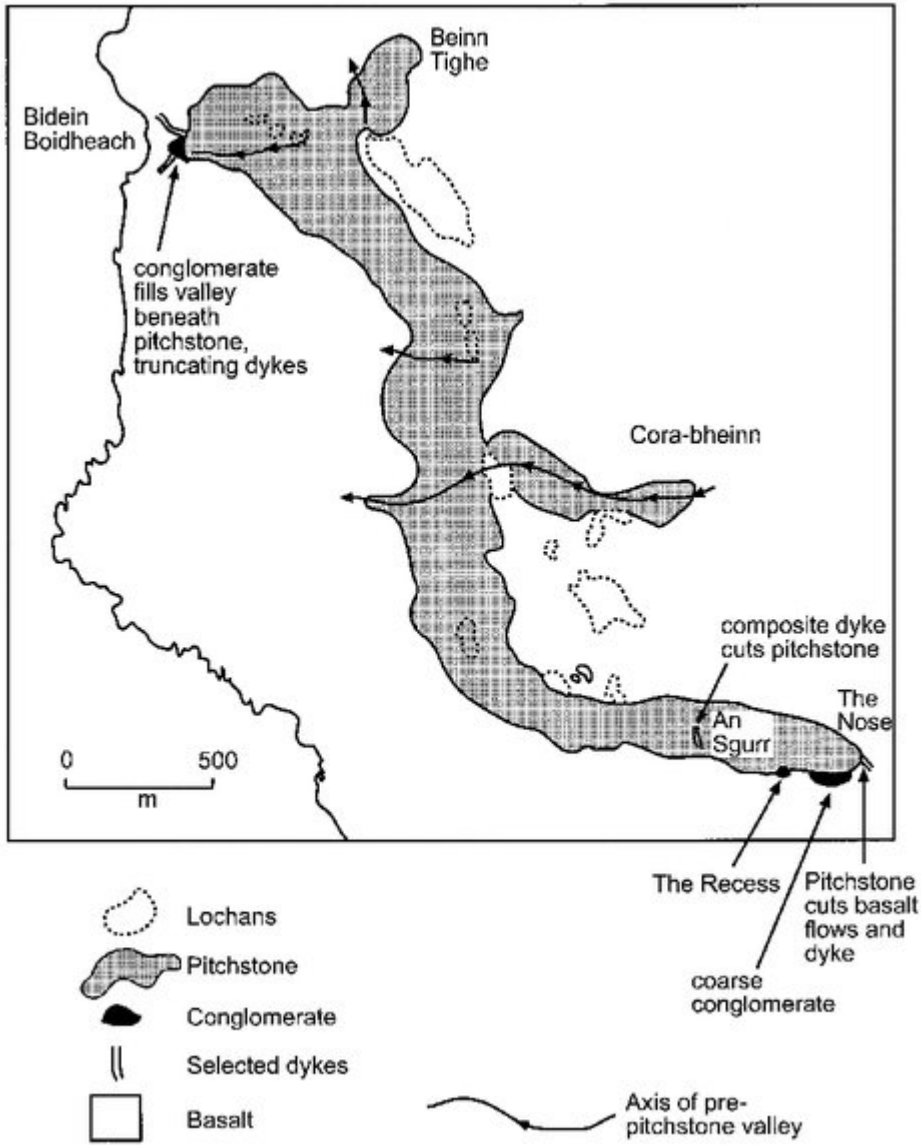


Figure 37 Map of the pitchstone outcrop, showing the locations of valleys eroded in the older basalt lava flows. By permission IPR/25-11C— British Geological Survey.