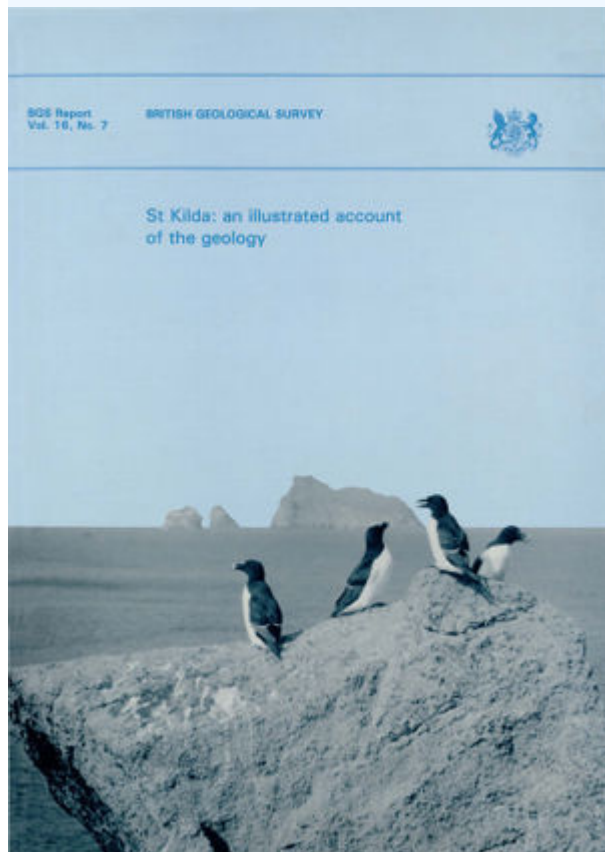


St. Kilda: an illustrated account of the geology

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[Jump to navigation](#) [Jump to search](#)

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Front cover.



Rear cover. St. Kilda: an illustrated account of the geology



Contents

- [1 St. Kilda: an illustrated account of the geology](#)
- [2 Summary](#)
- [3 Specimens referred to in the text](#)
- [4 Acknowledgements](#)
- [5 References](#)

St. Kilda: an illustrated account of the geology

[Summary](#)

[Introduction](#)

[The Western Gabbro - field description](#)

[The Western Gabbro - petrology](#)

[The Cambir Dolerite](#)

[Breccia of gabbros and dolerites - field description](#)

[Breccia of gabbros and dolerites - petrology](#)

[Glen Bay Gabbro](#)

[Pegmatites](#)

[Metamorphism](#)

[Glen Bay Granite](#)

[Mullach Sgar Complex - field description](#)

[Mullach Sgar Complex - petrology](#)

[Conachair Granite](#)

[Minor intrusions](#)

[Minor intrusions - petrology](#)

[Minor intrusions - geochemistry](#)

[Quaternary deposits](#)

[The mineralogy of stream sediments of Hirta](#)

[The seabed and coastal features](#)

[Fracturing and faulting](#)

[Palaeomagnetism](#)

[The age of the Conachair Granite](#)

[Geochemistry of the major intrusions](#)

[Summary of the geological history of St Kilda](#)

[Acknowledgements](#)

[Specimen notation](#)

[References](#)

Summary

The islands of St Kilda consist of a range of intrusive igneous rocks which were formed in a Tertiary volcano about 60 million years (Ma) ago. The oldest rock is the Western Gabbro (E^w), a banded and layered intrusion with an overall dip of 45°E in the north and 45°N in the south. At its eastern margin parts of the Gabbro have been intensely sheared and recrystallised prior to intrusion of the younger rocks of the Mullach Sgar Complex. The Cambir Dolerite intrudes the Western Gabbro on the western cliffs of the Cambir as thin veins which have a fine-grained metamorphic granoblastic texture. Blocks of gabbro, identical to the Western Gabbro, have been mixed with other gabbros and dolerites and form a widespread breccia (EK) which comprises most of Boreray, Soay and Glacan Mor. The gabbros may once have formed a large layered intrusion which underwent metamorphism, disintegration and finally intrusion by tholeiites and microbreccias. South of the tunnel in Glen Bay the igneous breccias (EK) is cut by the Glen Bay Gabbro (E^G). The gabbro has been chilled to a glassy basalt against the breccias, and it itself divided into two parts by intrusion of the Glen Bay

Granite (G). This represents the first evidence of granitic activity on St Kilda and immediately preceded formation of the Mullach Sgar Complex. The Complex consists of four major intrusive phases, each having a mafic and a felsic component, some resembling ring dykes and others extensively fragmented. The last major intrusion on St Kilda was the Conachair Granite (I), a leucocratic, very drusy rock intruded 55 Ma ago with an initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratio of 0.7041. Late dykes and sheets of a range of dolerites and felsites cut the major intrusions and represent the last phase of igneous activity. Neither lavas nor Tertiary sediments have been found on St Kilda although minerals from contact and regional metamorphic environments occur in the stream sediments and probably represent the residues from rocks that originally enclosed the volcanic centre. Early faults trend NW-SE on Hirta and a later series of NE-SW tensional faults are partly responsible for such features as the Dun Passage and the Cambir neck. Palaeomagnetic data indicate that the major intrusions crystallised in a reversed-polarity magnetic field between 50 and 60 Ma ago, and that St Kilda has drifted north about 19° since that time.

The dominant topographical features of St Kilda are the result of Quaternary glaciation and a small glacier probably occupied Village Bay during the Devensian glacial maximum. Today St Kilda is part of a drowned landscape.

Specimens referred to in the text

Prefix Collection

S — Rock from the Scottish Sliced Rock Collection housed at BGS, Murchison House, Edinburgh

MR — Rock from the Museum Reserve Collection housed at BGS, Exhibition Road, London

HM — Rock from the Hunterian Museum, Glasgow

CC — Rock from the Cockburn Collection, Royal Scottish Museum, Edinburgh

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- Not logged in
- [Talk](#)
- [Contributions](#)
- [Log in](#)
- [Request account](#)

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- [Page](#)
- [Discussion](#)

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Views

- [Read](#)
- [Edit](#)
- [View history](#)
- [PDF Export](#)

More

Search

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- [Main page](#)
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- [Random page](#)
- [Help about MediaWiki](#)

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- [Related changes](#)
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