

Banffshire coast - an excursion

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

From: Unpublished report prepared for the Edinburgh Geological Society Excursion to the Banffshire Coast. 14th - 21st May, 2005. Leaders: John Mendum, Douglas Fettes, David Stephenson and David Gould (British Geological Survey)

Itinerary



View north east to Crovie. Devonian rocks crop out on the foreshore but are faulted against Dalradian Southern Highland Group arenites and pelites of the Macduff Slate Formation that form the headland beyond the village. P010069.

[Day 1. Travel to Cullen, via Tomintoul, Dufftown and Keith. Ballachulish and Blair Atholl Subgroup \(Tomintoul and Upper Glenrinnnes\). Keith Granite at Strathisla Distillery. \(Sat 14th May 2005\)](#)

[Day 2. Findochty - Portknockie - Cullen - Findlater Castle. Grampian Group - Lochaber Subgroup rocks. \(Sun 15th May 2005\)](#)

[Day 3. Garron Point - Sandend Bay West and East - Portsoy West Appin Group - Lochaber, Ballachulish and Blair Atholl Subgroup rocks. Argyll Group - Islay and Easdale Subgroup rocks. The Portsoy Shear Zone. \(Mon 16th May 2005\)](#)

[Day 4. Portsoy Central - Links Bay - East Head Easdale Subgroup - the Portsoy Shear Zone. Serpentinised ultramafic rocks - metagabbros - pegmatitic granites. Crinan Subgroup rocks. \(Tue](#)

[17th May 2005\)](#)

[Day 5. Boyne Bay - Whitehills - Inverboyndie - Macduff - Tarlair Tayvallich and Crinan Subgroup rocks - the Boyne Line - Southern Highland Group rocks - Buchan metamorphic zones. \(Wed 18th May 2005\)](#)

[Day 6. Fraserburgh - Inverallochy - Gardenstown - Boggierow Wood Crinan-Tayvallich Subgroup - Migmatites, diorites and granites - Early and Mid Devonian rocks - Portsoy Granite. \(Thur 19th May 2005\)](#)

[Day 7. Teindland - Ardwell Bridge - Cabrach - Clatt - Huntly Ipswichian palaeosol - Argyll Group metavolcanic rocks - Northeast Grampian Basic Suite \(layered mafic and ultramafic plutons\). \(Fri 20th May 2005\)](#)

[Day 8. Return to Edinburgh via Windy Hills, Collieston, Aberdeen. ?Neogene gravels - Southern Highland Group rocks - metadolerite sills - F₁, F₃ folding. \(Sat 21st May 2005\)](#)

[Regional setting](#)

[Dalradian Supergroup](#)

[Devonian](#)

[Mesozoic and Cainozoic rocks and deposits](#)

There is, on the one hand, the truly magnificent coast-section, perfectly continuous over tens of miles and showing in all some fifty miles of Highland Schists. Part of this section runs across the regional strike and plunge; part along them. Against these agreeable arrangements has to be set the poorly exposed condition of much of Lower Banffshire and the Strathbogie, Buchan and Formartine districts of Aberdeenshire.' indeed, it is likely that the course of north-east Scottish geology would have been rather different if this splendid section had been investigated first and the divisions so established had then been traced inland. But the areas of one-inch map-sheets are rectangular and the official mind is often as rigidly confined. H.H. Read, 1955.

History of research

The northeast Scotland coast section was first mapped by the Geological Survey in the late 1800's, notably by J S Grant Wilson in the Fraserburgh and Peterhead areas and by J Horne in the Banff area. Inland, L W Hinxman covered much of upland Banffshire extending to Glenfiddich, Glenlivet and the Cairngorms. However, it was H H Read who in 1917 commenced the mapping of the Banffshire Coast and subsequently (1927, 1928) parts of Deeside that made the greatest impact on the geology (see Read, 1955, for excellent summary of the history). In the course of this and subsequent work Read formulated and promulgated the concept of the Banff Nappe (Read, 1923; 1955). This structure contained the Banff Division rocks that were of lower metamorphic grade and structural complexity than the underlying Keith Division rocks. Read postulated that the two divisions were separated by the Boyne Line, a line of discontinuity with lag (i.e. extensional)

geometry. Read's students, J Sutton and J V Watson also produced several important papers on the coast section applying sedimentary, structural and stratigraphical analysis (Sutton and Watson, 1955, 1956). Sutton and Watson (1954) also first reported the Macduff 'Boulder Bed' as a possible glacial phenomenon.

Subsequent work has focussed on the structure (e.g. Johnson, 1962; Treagus and Roberts, 1981) and particularly on the metamorphism (Fettes, 1970; Harte and Hudson, 1979; Hudson, 1985; Beddoe Stephens, 1990; Hudson and Kearns, 2000; Johnson et al, 2001, 2003). Detailed remapping of the coast section and much of the inland East Grampian area by the Geological Survey in the 1980's and early 1990's has clarified the Dalradian stratigraphy and enabled the regional structural and metamorphic patterns to be better elucidated. The area is now covered by a set of 1:50 000 geological maps for both the bedrock and superficial deposits. The nature of the 'Older' and 'Younger' Basic intrusions, now all included within the Northeast Grampian Basic Suite, has been resolved (Munro, 1970, 1984; Munro and Gallagher, 1984), and U-Pb zircon age dating has shown they are all of Early Ordovician age (Dempster et al, 2002, Oliver et al, 2000; Carty, 2001). The Geology of the Aberdeen area (Trewin et al, 1987) provided an excellent reference and field excursion guide to coastal localities of Northeast Scotland stretching from Lossiemouth to Fraserburgh, Stonehaven and St Cyrus, and inland to Edzell, Braemar and Huntly. The Cainozoic geology has also been subject to intensive research and age dating. T F Jamieson first published a wealth of detail about the Quaternary and earlier ?Neogene deposits in the late 1800's. His mantle was taken on by A Bremner and H H Read in the 20th century. The recent publication of the memoir of the Cainozoic geology and landscape evolution of Northeast Scotland (Merritt et al, 2003) summarised the early work and provides a definitive and exhaustive account of the Quaternary and earlier ?Neogene deposits and their evolution. The Quaternary Research Association field guide to the Banffshire coast and Buchan (Merritt et al, 2000) is also a valuable reference work. For a more regional view of the bedrock and Quaternary geology, the Geology of Scotland (Trewin, 2002) is recommended.

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- [4. Grampian Highlands](#)
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Navigation menu

Personal tools

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

Namespaces

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

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Views

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

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- [Recent changes](#)
- [Random page](#)
- [Help about MediaWiki](#)

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- [What links here](#)
- [Related changes](#)
- [Special pages](#)
- [Permanent link](#)
- [Page information](#)
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