

# References - Geological excursion guide to the North-west Highlands of Scotland

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## References for the full excursion guide

AMOR,K.,HESSELBO,S.P.,PORCELLI,D., THACKREY, S. and PARNELL, J.(2008): A Precambrian proximal ejecta blanket from Scotland,*Geology*, **36**, pp. 303-306.

ATTFIELD,P. (1987): The Structural History of the Canisp Shear Zone, in PARK, R.G. and TARNEY,J. (eds): *Evolution of the Lewisian and Comparable Precambrian High Grade Terranes*, Geological Society Special Publication, **27** (London: The Geological Society),pp. 165-73.

BAILEY, E. B. (1935): The Glencoul Nappe and the Assynt Culmination,*Geological Magazine*, **72**, pp. 151-65.

BARBER,A. J.,BEACH, A.,PARK, R.G., TARNEY,J. and STEWART, A. D. (1978): The Lewisian and Torridonian Rocks of North-west Scotland, *Geologists' Association Field Guide*,no. 21.

BARBER,A. J. and SOPER, N. J. (1973): Summerfield meeting in the North-West of Scotland, *Proceedings of the Geologists Association*, **84**, pp. 207-35.

BARNICOAT,A. C. and O'HARA, M. J. (1979):High temperature pyroxenes from an ironstone at Scourie, *Mineralogical Magazine*, **43**, pp. 371-75.

BEACH, A.(1973): The mineralogy of high temperature shear zones at Scourie ,NW Scotland, *Journal of Petrology*, **14**, pp. 231-48.

BEACH, A.(1978): The Scourie-Laxford Region (Lewisian), in BARBER, A. J., BEACH, A., PARK, R. G.,TARNEY, J. and STEWART, A. D. (eds): The Lewisian and Torridonian Rocks of North-West Scotland, *Geologists' Association Field Guide*,no.21, pp. 14-27.

BEACH,A.,COWARD,M.P.and GRAHAM, R. H. (1974):An interpretation of the structural evolution of the Laxford Front, north-westScotland,*Scottish Journal of Geology*,**9**, pp. 297-308.

BEACOM, L. E. (1999): *The kinematic evolution of reactivated and non-reactivated faults in basement rocks, NW Scotland*. Unpub. PhD Thesis, Queen's University of Belfast.

BEACOM,L.E., ANDERSON,T. B.and HOLDSWORTH, R. E. (1999): Using basement-hosted clastic dykes as syn-rifting palaeostress indicators; an example from the basal Stoer Group, NorthwestScotland, *Geological Magazine*, **136**, pp.301-310.

BEACOM,L.E., HOLDSWORTH, R.E., McCaffrey, K. J.W. and ANDERSON, T. B. (2001): A

- quantitative study of the influence of pre-existing compositional and fabric heterogeneities upon fracture zone development during reactivation, in HOLDSWORTH, R. E., STRACHAN, R., MAGLOUGHIN, J. F. and KNIPE, R. J. (eds): *The nature and tectonic significance of fault zone weakening*, Geological Society Special Publication, **186** (London: The Geological Society), pp. 195-211.
- BOYER, S. E. and ELLIOTT, D. (1982): Thrust systems, *Bulletin of the American Association of Petroleum Geologists*, **66**, pp. 1196-230.
- BRITISH GEOLOGICAL SURVEY (1998): Summer Isles, Scotland Sheet 101W, Solid and Drift geology, 1:50,000 (Keyworth, Nottingham: British Geological Survey).
- BRITISH GEOLOGICAL SURVEY (2002a): Loch Eriboll, Scotland Sheet 114W, 1:50,000 (Keyworth, Nottingham: British Geological Survey).
- BRITISH GEOLOGICAL SURVEY (2002b): Point of Stoer. Scotland Sheet 107W, Solid and Drift Geology, 1:50,000 (Keyworth, Nottingham: British Geological Survey).
- BRITISH GEOLOGICAL SURVEY (2007): Assynt, Scotland Special Sheet, Bedrock, 1:50,000, Geology Series (Keyworth, Nottingham: British Geological Survey).
- BRITISH GEOLOGICAL SURVEY (2008): Scotland Sheet 101E Ullapool, Bedrock. 1:50,000 (Keyworth, Nottingham: British Geological Survey).
- BURTON, K. W., CAPMAS, F., BIRCK, J.-L., ALLEGRE, C. J. and COHEN, A. S. (2000): Resolving crystallisation ages of Archaean mafic-ultramafic rocks using the Re-Os isotope system, *Earth and Planetary Science Letters*, **179**, pp. 453-67.
- BUTLER, R. W. H. (1982): A structural analysis of the Moine Thrust Zone between Loch Eriboll and Foinaven, NW Scotland, *Journal of Structural Geology*, **4**, pp. 19-29.
- BUTLER, R. W. H. (1987): Thrust Sequences, *Journal of the Geological Society of London*, **144**, pp. 619-34.
- BUTLER, R. W. H. (1988): The Moine Thrust Belt at Loch Eriboll, in ALLISON, I., MAY, F. and STRACHAN, R. (eds): *An Excursion Guide to the Moine Geology of the Scottish Highlands* (Edinburgh: Scottish Academic Press), pp. 195-215.
- BUTLER, R. W. H. (1997): Late Proterozoic rift faults and basement-cover relationships within the Ben More thrust sheet, NW Scotland, *Journal of the Geological Society of London*, **154**, pp. 761-64.
- BUTLER, R. W. H. (2004): The nature of 'roof thrusts' in the Moine Thrust Belt, NW Scotland: implications for the structural evolution of thrust belts, *Journal of the Geological Society of London*, **161**, pp. 849-60.
- BUTLER, R. W. H. (2007): Peach and Horne - the memoir at 100, *Geoscientist*, **17**, pp. 20-25.
- BUTLER, R. W. H. (2009): Moine Thrust Belt, in MENDUM, J. R., BARBER, A. J., BUTLER, R. W. H., FLINN, D., GOODENOUGH, K. M., KRABBENDAM, M., PARK, R. G. and STEWART, A. D. (eds): *Lewisian, Torridonian and Moine Rocks of Scotland*, *Geological Conservation Review Series*, vol. 34, pp. 229-348 (Peterborough: Joint Nature Conservation Committee)

- BUTLER, R. W. H., HOLDSWORTH, R. E. and MATTHEWS, S. J. (2006): Styles of basement involvement in the Moine Thrust Belt, NW Scotland, in MAZZOLI, S. and BUTLER, R. W. H. (eds): *Styles of continental contraction*, Special Paper of the Geological Society of America, **414**.
- CADELL, H. M. (1888): Experimental researches in mountain building, *Transactions of the Royal Society of Edinburgh*, **35**, pp. 337-57.
- CALLAWAY, C. (1884): Notes on progressive metamorphism, *Geological Magazine*, **1**, pp. 218-24.
- CARTWRIGHT, I. and BARNICOAT, A. C. (1987): Petrology of Scourian supra-crustal rocks and orthogneisses from Stoer, NW Scotland: implications for the geological evolution of the Lewisian complex, in PARK, R. G. and TARNEY, J. (eds): *Evolution of the Lewisian and comparable Precambrian high-grade terrains*, Geological Society Special Publication, **27** (London: The Geological Society), pp. 93-107.
- CAWOOD, P. A., NEMCHIN, A. A., STRACHAN, R. A., KINNY, P. D. and LOEWY, S. (2004): Laurentian provenance and an intracratonic tectonic setting for the Moine Supergroup, Scotland, constrained by detrital zircons from the Loch Eil and Glen Urquhart successions, *Journal of the Geological Society of London*, **161**, pp. 861-74.
- CHAPMAN, H. J. (1979): 2390 Myr Rb-Sr whole-rock age for the Scourie dykes of north-west Scotland, *Nature*, **277**, pp. 652-43.
- CHOWDHARY, P. K. and BOWES, D. R. (1972): Structure of Lewisian rocks between Loch Inchard and Loch Laxford, Sutherland, Scotland, *Krystalinikum*, **9**, pp. 21-51.
- CHRISTIE, J. M. (1956): *The post-Cambrian thrusts of the Assynt region*, Unpublished PhD Thesis, University of Edinburgh.
- CHRISTIE, J. M. (1960): Mylonitic rocks of the Moine thrust zone in the Assynt region, northwest Scotland, *Transactions of the Edinburgh Geological Society*, **18**, pp. 79-93.
- CHRISTIE, J. M. (1963): The Moine thrust zone in the Assynt region, Northwest Scotland, *University of California Publications in Geological Sciences*, **40**, pp. 345-440.
- CHRISTIE, J. M. (1965): The Moine thrust zone in the Assynt region, northwest Scotland (discussion), *Journal of Geology*, **73**, pp. 672-81.
- CORFU, F., HEAMAN, L. M. and ROGERS, G. (1994): Polymetamorphic evolution of the Lewisian complex, NW Scotland, as recorded by U-Pb isotopic compositions of zircon, titanite and rutile, *Contributions to Mineralogy and Petrology*, **117**, pp. 215-28.
- COWARD, M. P. (1980): The Caledonian thrust and shear zones of NW Scotland, *Journal of Structural Geology*, **2**, pp. 11-17.
- COWARD, M. P. (1982): Surge zones in the Moine Thrust Zone of NW Scotland, *Journal of Structural Geology*, **4**, pp. 247-56.
- COWARD, M. P. (1983): The thrust and shear zones of the Moine Thrust Zone of NW Scotland, *Journal of the Geological Society of London*, **140**, pp. 795-811.
- COWARD, M. P. (1984): A geometrical study of the Arnaboll and Heilam thrust sheets, NW of Ben Arnaboll, Sutherland, *Scottish Journal of Geology*, **20**, pp. 87-106.

- COWARD, M. P. (1985): The thrust structures of southern Assynt, Moine thrust zone, *Geological Magazine*, **122**, pp. 596-607.
- COWARD, M. P. (1988): The Moine Thrust and the Scottish Caledonides, in MITRA, G. and WOJTAL, S. (eds): *Geometries and Mechanics of Thrusting, with special refer-ence to the Appalachians*, Geological Society of America Special Paper, **222**, pp. 1-16.
- COWARD, M. P. and ENDFIELD, M. A. (1987): The structure of the West Orkney and adjacent basins, in BROOKS, J. and GLENNIE, K. (eds): *The Petroleum Geology of NW Europe* (Graham and Trotman), pp. 687-96.
- COWARD, M. P. and KIM, J. H. (1981): Strain within thrust sheets, in McCLAY, K. R. and PRICE, N. J. (eds): *Thrust and Nappe Tectonics*, Geological Society Special Publication, **9** (London: The Geological Society), pp. 275-92.
- COWIE, J. W. and McNAMARA, K. J. (1978): Olenellus (Trilobita) from the Lower Cambrian strata of northwest Scotland, *Palaeontology*, **21**, pp. 615-34.
- DALLMEYER, R. D., STRACHAN, R. A., ROGERS, G., WATT, G. R. and FRIEND, C. R. L. (2001): Dating deformation and cooling in the Caledonian thrust nappes of north Sutherland, Scotland: insights from <sup>40</sup>Ar/<sup>39</sup>Ar and Rb-Sr chronology, *Journal of the Geological Society of London*, **158**, pp. 501-12.
- DAVIES, F. B. (1974): A layered basic complex in the Lewisian, south of Loch Laxford, Sutherland, *Journal of the Geological Society of London*, **130**, pp. 279-84.
- DAVISON, S. and HAMBREY, M. J. (1996): Indications of glaciation at the base of the Proterozoic Stoer Group (Torridonian), NW Scotland, *Journal of the Geological Society of London*, **153**, pp. 139-49.
- DAVISON, S. and HAMBREY, M. J. (1997): Discussion on indications of glaciation at the base of the Proterozoic Stoer Group (Torridonian), NW Scotland, *Journal of the Geological Society of London*, **154**, pp. 1087-88.
- ELLIOTT, D. and JOHNSON, M. R. W. (1980): Structural evolution in the northern part of the Moine thrust belt, NW Scotland, *Transactions of the Royal Society of Edinburgh: Earth Sciences*, **71**, pp. 69-96.
- EVANS, C. R. (1965): Geochronology of the Lewisian basement near Lochinver, Sutherland, *Nature*, **204**, pp. 638-41.
- EVANS, D. J. and WHITE, S. H. (1984): Microstructural and fabric studies from the rocks of the Moine nappe, Eriboll, NW Scotland, *Journal of Structural Geology*, **6**, pp. 369-90.
- FISCHER, M. W. and COWARD, M. P. (1982): Strains and folds within thrust sheets: the Heilam sheet NW Scotland, *Tectonophysics*, **88**, pp. 291-312.
- FREEMAN, S. R., BUTLER, R. W. H., CLIFF, R. A. and REX, D. C. (1998): Direct dating of mylonite evolution; a multi-disciplinary geochronological study from the Moine thrust zone, NW Scotland, *Journal of the Geological Society of London*, **155**, pp. 745-58.
- FRIEND, C. R. L., JONES, K. A. and BURNS, I. M. (2000): New high-pressure granulite event in the Moine Supergroup, northern Scotland: implications for Taconic (early Caledonian) crustal evolution,

*Geology*, **28**, pp. 543-46.

FRIEND, C. R. L. and KINNY, P. D. (1995): New evidence for protolith ages of Lewisian granulites, northwest Scotland, *Geology*, **23**, pp. 1027-1030.

FRIEND, C. R. L. and KINNY, P. D. (2001): A reappraisal of the Lewisian Gneiss Complex: geochronological evidence for its tectonic assembly from disparate terranes in the Proterozoic, *Contributions to Mineralogy and Petrology*, **142**, pp. 198-218.

FRIEND, C. R. L., KINNY, P. D., ROGERS, G., STRACHAN, R. A. and PATTERSON, B. A. (1997): U-Pb zircon geo-chronological evidence for Neoproterozoic events in the Glenfinnan Group (Moine Supergroup): the formation of the Ardgour granite gneiss, north-west Scotland, *Contributions to Mineralogy and Petrology*, **128**, pp. 101-113.

FRIEND, C. R. L., STRACHAN, R. A., KINNY, P. D. and WATT, G. R. (2003): Provenance of the Moine Supergroup of NW Scotland; evidence from geochronology of detrital and inherited zircons from (meta)-sedimentary rocks, granites and migmatites, *Journal of the Geological Society of London*, **160**, pp. 247-57.

GEIKIE, A. (1884): The crystalline schists of the Scottish Highlands, *Nature*, **31**, pp. 29-31.

GLENDINNING, N. R. W. (1988): Sedimentary structures and sequences within a late Proterozoic tidal shelf deposit; the upper Morar Psammite Formation of north-western Scotland, in WINCHESTER, J. A. (eds): *Later Proterozoic stratigraphy of the Northern Atlantic Regions* (Glasgow and London: Blackie), pp. 17-31.

GOODENOUGH, K. M., EVANS, J. A. and KRABBENDAM, M. (2006): Constraining the maximum age of movements in the Moine Thrust Belt: dating the Canisp Porphyry, *Scottish Journal of Geology*, **42**, pp. 77-82.

GOODENOUGH, K. M., MILLAR, I. L., STRACHAN, R., KRABBENDAM, M. and EVANS, J. A. (2011): Timing of regional deformation and development of the Moine Thrust Zone in the Scottish Caledonides: constraints from the U-Pb geochronology of alkaline intrusions, *Journal of the Geological Society of London*, **168**, pp. 99-114.

GOODENOUGH, K. M., PARK, R. G., KRABBENDAM, M., MYERS, J. S., WHEELER, J., LOUGHLIN, S., CROWLEY, Q., L, F. C. R., BEACH, A., KINNY, P. D. and GRAHAM, R. (2010): The Laxford Shear Zone: an end-Archaean terrane boundary?, in LAW, R., BUTLER, R. W. H., HOLDSWORTH, R. E., KRABBENDAM, M. and STRACHAN, R. (eds): *Continental Tectonics and Mountain Building*, Geological Society Special Publication, **335** (London: The Geological Society), pp. 101-118.

GOODENOUGH, K. M., YOUNG, B. N. and PARSONS, I. (2004): The minor intrusions of Assynt, NW Scotland: early development of magmatism along the Caledonian Front, *Mineralogical Magazine*, **68**, pp. 541-60.

GRACIE, A. J. and STEWART, A. D. (1967): Torridonian sediments at Enard Bay, Ross-shire, *Scottish Journal of Geology*, **3**, pp. 181-94.

HALLIDAY, A. N., AFTALION, M., PARSONS, I., DICKIN, A. P. and JOHNSON, M. R. W. (1987): Syn-orogenic alkaline magmatism and its relationship to the Moine Thrust Zone and the thermal state of the lithosphere in NW Scotland, *Journal of the Geological Society of London*, **144**, pp. 611-17.

HAQ, B. U. and SCHUTTER, S. R. (2009): A chronology of Palaeozoic sea-level changes, *Science*,

322, pp. 64-68.

HEAMAN, L. and TARNEY, J. (1989): U-Pb baddeleyite ages for the Scourie dyke swarm, Scotland: evidence for two distinct intrusion events, *Nature*, **340**, pp. 705-708.

HIGGINS, A. K., SMITH, M. P., SOPER, N. J., LESLIE, A. G., RASMUSSEN, J. A. and SONDERHOLM, M. (2001): The Neo-proterozoic Hekla Sund Basin, Eastern North Greenland: a pre-Iapetan extensional sequence thrust across its rift shoulders during the Caledonian orogeny, *Journal of the Geological Society of London*, **158**, pp. 487-99.

HIPPLER, S. J. and KNIPE, R. J. (1990): The evolution of cataclastic fault rocks from a pre-existing mylonite, in KNIPE, R. J. and RUTTER, E. H. (eds): *Deformation Mechanisms, Rheology and Tectonics*, Geological Society Special Publication, **54**(London: the Geological Society), pp. 71-79.

HOLDSWORTH, R. E., ALSOP, G. I. and STRACHAN, R. A. (2007): Tectonic stratigraphy and structural continuity of the northernmost Moine Thrust Zone and Moine Nappe, Scottish Caledonides, in RIES, A. C., BUTLER, R. W. H. and GRAHAM, R. H. (eds): *Deformation of the Continental Crust: the Legacy of Mike Coward*, Geological Society Special Publication, **272**(London: The Geological Society), pp. 121-42.

HOLDSWORTH, R. E., STRACHAN, R. and ALSOP, G. I. (2001): Geology of the Tongue District, *Memoir of the British Geological Survey* (London: HMSO).

HOLDSWORTH, R. E., STRACHAN, R. A., ALSOP, G. I., GRANT, C. J. and WILSON, R. W. (2006): Thrust sequences and the significance of low-angle, out-of-sequence faults in the northernmost Moine Nappe and Moine Thrust Zone, NW Scotland, *Journal of the Geological Society of London*, **163**, pp. 801-814.

HUSELBEE, M. Y. and THOMAS, A. T. (1998): Olenellus and conodonts from the Durness Group, NW Scotland, and the correlation of the Durness succession, *Scottish Journal of Geology*, **34**, pp. 83-88.

JOHNSON, M. R. W. (1965): The Moine Thrust: a discussion, *Journal of Geology*, **73**, pp. 672-75.

JOHNSON, M. R. W. (1967): Mylonite zones and mylonite banding, *Nature*, **213**, pp. 246-47.

JOHNSON, M. R. W. and PARSONS, I. (1979): *Geological Excursion Guide to the Assynt District of Sutherland* (Edinburgh: Edinburgh Geological Society).

KELLEY, S. P. (1988): The relationship between K-Ar mineral ages, mica grain sizes and movement on the Moine Thrust Zone, NW Highlands, Scotland, *Journal of the Geological Society of London*, **145**, pp. 1-10.

KINNAIRD, T. C., PRAVE, A., KIRKLAND, C. L., HORSTWOOD, M., PARRISH, R. and BATCHELOR, R. A. (2007): The late Mesoproterozoic-early Neoproterozoic tectonostratigraphic evolution of NW Scotland: the Torridonian revisited, *Journal of the Geological Society of London*, **164**, pp. 541-51.

KINNY, P. and FRIEND, C. (1997): U-Pb iso-topic evidence for the accretion of different crustal blocks to form the Lewisian Complex of Northwest Scotland, *Contributions to Mineralogy and Petrology*, pp. 326-40.

KINNY, P. D., FRIEND, C. R. L. and LOVE, G. J. (2005): Proposal for a terrane-based nomenclature for the Lewisian Complex of NW Scotland, *Journal of the Geological Society of London*, **162**, pp. 175-86.

- KINNY, P. D., FRIEND, C. R. L., STRACHAN, R. A., WATT, G. R. and BURNS, I. M. (1999): U-Pb geochronology of regional migmatites in East Sutherland, Scotland; evidence for crustal melting during the Caledonian Orogeny, *Journal of the Geological Society of London*, **156**, pp. 1143-52.
- KINNY, P. D., STRACHAN, R. A., FRIEND, C. R. L., KOCKS, H., ROGERS, G. and PATERSON, B. A. (2003): U-Pb geo-chronology of deformed metagranites in central Sutherland, Scotland; evidence for widespread late Silurian metamorphism and ductile deformation of the Moine Super-group during the Caledonian orogeny, *Journal of the Geological Society of London*, **160**, pp. 259-69.
- KNIGHT, I. and JAMES, N. P. (1987): Strati-graphy of the St George Group (Lower Ordovician), western Newfoundland: the interaction between eustasy and tectonics, *Canadian Journal of Earth Sciences*, **24**, pp. 1927-52.
- KRABBENDAM, M. and LESLIE, A. G. (2004): Lateral ramps and thrust termin-ations: an example from the Moine Thrust Zone, NW Scotland, *Journal of the Geolog-ical Society of London*, **161**, pp. 551-54.
- KRABBENDAM, M. and LESLIE, A. G. (2010): Lateral variations and linkages in thrust geometry: the Traligill Transverse Zone, Assynt Culmination, Moine Thrust Belt, NW Scotland, in LAW, R., BUTLER, R. W. H., HOLDSWORTH, R. E., KRABBENDAM, M. and STRACHAN, R. (eds): *Continental Tectonics and Moun-tain Building*, Geological Society Special Publication, **335** (London: The Geological Society of London), pp. 333-56.
- KRABBENDAM, M., PRAVE, A. P. and CHEER, D. (2008): A fluvial origin for the Neoproterozoic Morar Group, NW Scot-land; implications for Torridon-Morar Group correlation and the Grenville Orogen Foreland Basin, *Journal of the Geological Society of London*, **165**, pp. 379-94.
- LAPWORTH, C. (1883): On the structure and metamorphism of the rocks of the Durness-Eribolldistrict, *Proceedings of the Geological Association*, **8**, pp. 438-42.
- LAPWORTH, C. (1885): The Highland Con-troversy in British geology: its causes, course and consequence, *Nature*, **32**, pp. 558-59.
- LAW, R. D. (1987): Heterogeneous deforma-tion and quartz crystallographic fabric tran-sitions; natural examples from the Moine thrustzoneattheStackofGlencoul,northern Assynt, *Journal of Structural Geology*, **9**, pp. 819-33.
- LAW, R. D. (1998): Quartz mylonites from the Moine thrust zone at the Stack of Glencoul, NW Scotland, in SNOKE, A. W., TULLIS, J. and TODD, V. R. (eds): *Fault-Related Rocks: a Photographic Atlas* (Princeton, New Jersey: Princeton University Press), pp. 490-93.
- LAW, R. D. (2010): Moine thrust zone mylon-ites at the Stack of Glencoul: II - results of vorticity analyses and their tectonic signifi-cance, in LAW, R. D., BUTLER, R. W. H., HOLDSWORTH, R., KRABBENDAM, M. and STRACHAN, R. A. (eds): *Continental Tectonics and Mountain Building - The Legacy of Peach and Horne*, Geological Society Special Publication (London: The Geological Society), **335**, 579-602.
- LAW, R. D., BUTLER, R. W. H., HOLDSWORTH, R., KRABBENDAM, M. and STRACHAN, R. A. (eds) (2010a): *Continental Tectonics and Mountain Building - The Legacy of Peach and Horne*, Geological Society Special Publication (London: The Geological Society), **335**.
- LAW, R. D., CASEY, M. and KNIFE, R. J. (1986): Kinematic and tectonic significance of microstructural and crystallographic fabrics within quartz mylonites from the Assynt and Eriboll

- regions of the Moine thrust zone, NW Scotland, *Transactions of the Royal Society of Edinburgh, Earth Sciences*, **77**, pp. 99-126.
- LAW, R. D., MAINPRICE, D., CASEY, M., LLOYD, G. E., KNIPE, R. J., COOK, B. and THIGPEN, J. R. (2010b): Moine thrust zone mylonites at the Stack of Glencoul: I - microstructures, strain and influence of recrystallization on quartz crystal fabric development, in LAW, R. D., BUTLER, R. W. H., HOLDSWORTH, R., KRABBEN-DAM, M. and STRACHAN, R. A. (eds): *Continental Tectonics and Mountain Building - The Legacy of Peach and Horne*, Geological Society Special Publication (London: The Geological Society), **335**, 543-57.
- LAWSON, D. E. (1972): Torridonian volcanic sediments, *Scottish Journal of Geology*, **8**, pp. 345-62.
- McCLAY, K. R. and COWARD, M. P. (1981): The Moine Thrust Zone: an overview, in McCLAY, K. R. and PRICE, N. J. (eds): *Thrust and Nappe Tectonics*, Geological Society Special Publication, **9** (London: The Geological Society), pp. 241-60.
- MacGREGOR, M. and PHEMISTER, J. (1937): *Geological Excursion Guide to the Assynt District of Sutherland* (Edinburgh: Edinburgh Geological Society).
- McKIE, T. (1990): Tidal and storm influenced sedimentation from a Cambrian transgressive passive margin sequence, *Journal of the Geological Society of London*, **147**, pp. 785-94.
- McKIE, T. (1993): Relative sea-level changes and the development of a Cambrian transgression, *Geological Magazine*, **130**, pp. 245-56.
- McKIE, T. and DONOVAN, S. K. (1992): Lower Cambrian echinoderm ossicles from the Furoid Beds, northwest Scotland, *Scottish Journal of Geology*, **28**, pp. 49-53.
- McLEISH, A. J. (1971): Strain analysis of deformed pipe rock in the Moine Thrust Zone, northwest Scotland, *Tectonophysics*, **12**, pp. 469-503.
- MENDUM, J. R., BARBER, A. J., BUTLER, R. W. H., FLINN, D., GOODENOUGH, K. M., KRABBENDAM, M., PARK, R. G. and STEWART, A. D. (2009): *Lewisian, Torridonian and Moine rocks of Scotland*, *Geological Conservation Review Series*, **34** (Peterborough: Joint Nature Conservation Committee).
- MILLAR, I. L. (1999): Neoproterozoic extensional basic magmatism associated with emplacement of the West Highland granite gneiss in the Moine Supergroup of NW Scotland, *Journal of the Geological Society of London*, **156**, pp. 1153-62.
- MILNE, K. P. (1978): Folding and thrusting in the upper Glen Oykel area, Assynt, *Scottish Journal of Geology*, **14**, pp. 141-46.
- MORROW, D. W. (1978): Dolomitisation of Lower Palaeozoic burrow-fillings, *Journal of Sedimentary Petrology*, **48**, pp. 295-305.
- NICHOLAS, C. J. (1994): New stratigraphical constraints on the Durness Group of NW Scotland, *Scottish Journal of Geology*, **30**, pp. 73-85.
- NICHOLSON, P. G. (1993): *A basin reappraisal of the Proterozoic Torridon Group, northwest Scotland*, Special Publication of the International Association of Sedimentologists, **20**, pp. 183-202.



NIELSEN, A.-T. (2004): Ordovician sea level changes: a Baltoscandian perspective, in WEBBY, B. D., PARIS, F., DROSER, M. L. and PERCIVAL, I. G. (eds): *The Great Ordovician Biodiversification Event* (New York: Columbia University Press), pp. 84-93.

O'HARA, M. J. (1960): *The metamorphic petrology of the Scourie district, Sutherland*, unpub. PhD Thesis, University of Cambridge.

O'HARA, M. J. (1961a): Zoned ultrabasic and basic gneiss masses in the early Lewisian metamorphic complex at Scourie, Sutherland, *Journal of Petrology*, **2**, pp. 248-76.

O'HARA, M. J. (1961b): Petrology of the Scourie dyke, Sutherland, *Mineralogy Magazine*, **32**, pp. 848-65.

OLDROYD, D. R. (1990): *The Highlands Controversy: Constructing Geological Knowledge through Fieldwork in Nine-teenth-Century Britain* (Chicago: University of Chicago Press).

PALMER, T. J., MCKERROW, W. S. and COWIE, J. W. (1980): Sedimentological evidence for a stratigraphical break in the Durness Group, *Nature*, **287**, pp. 721-22.

PARK, R. G., CLIFF, R. A., FETTES, D. J. and STEWART, A. D. (1994): Precambrian rocks in northwest Scotland west of the Moine Thrust, in GIBBONS, W. and HARRIS, A. L. (eds): *A Revised Correlation of Precambrian Rocks in the British Isles*, Geological Society Special Report 22 (London: The Geological Society), pp. 6-22.

PARK, R. G. and TARNEY, J. (1987): The Lewisian complex: a typical Precambrian high-grade terrain?, in PARK, R. G. and TARNEY, J. (eds): *Evolution of the Lewisian and comparable Precambrian high-grade terrains*, Geological Society Special Publication, **27** (London: The Geological Society of London), pp. 13-25.

PARSONS, I. (1965a): The feldspathic syenites of the Loch Ailsh intrusion, Assynt, Scotland, *Journal of Petrology*, **6**, pp. 365-94.

PARSONS, I. (1965b): The sub-surface shape of the Loch Ailsh intrusion, Assynt, as deduced from magnetic anomalies across the contact, with a note on traverses across the Loch Borrolan Complex, *Geological Magazine*, **102**, pp. 46-58.

PARSONS, I. (1999): Late Ordovician to mid-Silurian alkaline intrusions of the North-west Highlands of Scotland, in STEPHENSON, D., BEVINS, R. E., MILLWARD, D., HIGHTON, A. J., PARSONS, I., STONE,

P. and WADSWORTH, W. J. (eds): *Caledonian Igneous Rocks of Great Britain*, Geological Conservation Review Series, **17** (Peterborough: Joint Nature Conservation Committee), pp. 345-93.

PARSONS, I. and MCKIRDY, A. P. (1983): The interrelationship of igneous activity and thrusting in Assynt: excavations at Loch Borralan, *Scottish Journal of Geology*, **19**, pp. 59-67.

PEACH, B. N. (1894): Additions to the Fauna of the Olenellus-zone of the North-West Highlands, *Quarterly Journal of the Geological Society of London*, **50**, pp. 661.

PEACH, B. N. and HORNE, J. (1892): The Olenellus zone in the North-West Highlands of Scotland, *Quarterly Journal of the Geological Society of London*, **48**, pp. 227.

PEACH, B. N., HORNE, J., GUNN, W., CLOUGH, C. T., HINXMAN, L. W. and TEALL, J. J. H. (1907):

*The geological structure of the North-West Highlands of Scotland*, Memoir of the Geological Society of Great Britain.

PHEMISTER, J. (1926): The alkaline igneous rocks of the Loch Ailsh District, in READ,

H. H., PHEMISTER, J. and ROSS, G. (eds): The Geology of Strath Oykell and Lower Loch Shin. Memoir of the Geological Survey of Great Britain, Sheet 102 (Scotland), pp. 22-111.

PIDGEON, R. T. and BOWES, D. R. (1972): Zircon U-Pb ages of granulites from the central region of the Lewisian of north-western Scotland, *Geological Magazine*, **109**, pp. 247-58.

PRIGMORE, J. K. and RUSHTON, A. W. A. (1999): Scotland: Cambrian and Ordovician of the Hebridean Terrane, in RUSHTON,

A. W. A., OWEN, A. W., OWENS, R. M. and PRIGMORE, J. K. (eds): British Cambrian to Ordovician Stratigraphy, *Geological Conservation Review Series*, **18**, pp. 295-315 (Chapman & Hall).

RAINBIRD, R. H., HAMILTON, M. A. and YOUNG, G. M. (2001): Detrital zircon geo-chronology and provenance of the Torridonian, NW Scotland, *Journal of the Geological Society of London*, **158**, pp. 15-27.

RAMSAY, J. G. and GRAHAM, R. (1970): Strain variation in shear belts, *Canadian Journal of Earth Sciences*, **7**, pp. 786-813.

RIDER, M. H. (2005): *Hutton's Arse* (Rogart: Rider-French Consulting).

ROGERS, G., HYSLOP, E. K., STRACHAN, R., PATERSON, B. A. and HOLDSWORTH, R. E. (1998): The structural setting and U-Pb geochronology of Knoydartian pegmatites in Invernessshire: evidence for Neoproterozoic tectono-thermal events in the Moine of NW Scotland, *Journal of the Geological Society of London*, **155**, pp. 685-96.

ROGERS, G., KINNY, P. D., STRACHAN, R. A., FRIEND, C. R. L. and PATTERSON, B. A. (2001): U-Pb geochronology of the Fort Augustus granite gneiss, constraints on the timing of Neoproterozoic and Paleozoic tectonothermal events in the NW Highlands of Scotland, *Journal of the Geological Society of London*, **158**, pp. 7-14.

ROLLINSON, H. R. (1981): Garnet-pyroxene thermometry and barometry in the Scourie granulites, *Lithos*, **14**, pp. 225-38.

SABINE, P. A. (1953): The petrography and geological significance of the post-Cambrian minor intrusions of Assynt and the adjoining districts of north-west Scotland, *Quarterly Journal of the Geological Society of London*, **109**, pp. 137-71.

SANDERS, I. S. and JOHNSTON, J. D. (1989): The Torridonian Stac Fada Member: an extrusion of fluidized peperite?, *Transactions of the Royal Society of Edinburgh, Earth Sciences*, **80**, pp. 1-4.

SANDERS, I. S. and JOHNSTON, J. D. (1990): Reply to: The Torridonian Stac Fada Member: a discussion, *Transactions of the Royal Society of Edinburgh, Earth Sciences*, **81**, pp. 249-50.

SAVAGE, D. and SILLS, J. D. (1980): High pressure metamorphism in the Scourian of NW Scotland: evidence from granet granulites, *Contributions to Mineralogy and Petrology*, **74**, pp. 153-63.

SEARLE, M. P., LAW, R. D., DEWEY, J. F. and STREULE, M. J. (2010): Relationships between the

Loch Ailsh and Borralan alkaline intrusions and thrusting in the Moine Thrust zone, southern Assynt Culmination, NW Scotland, in LAW, R., BUTLER, R. W. H., HOLDSWORTH, R. E., KRABBENDAM, M. and STRACHAN, R. (eds): *Continental Tectonics and Mountain Building: The Legacy of Peach and Horne*, Geological Society Special Publication, **335**(London: Geological Society of London).

SHERATON, J. W., SKINNER, A. C. and TARNEY, J. (1973): The geochemistry of the Scourian gneisses of the Assynt district, in PARK, R. G. and TARNEY, J. (eds): *The early Precambrian of Scotland and related rocks of Greenland* (Keele: University of Keele), pp. 31-43.

SILLS, J. D., SAVAGE, D., WATSON, J. V. and WINDLEY, B. F. (1982): Layered ultramafic-gabbro bodies in the Lewisian of northwest Scotland: geochemistry and petrogenesis, *Earth and Planetary Science Letters*, **58**, pp. 345-60.

SMITH, R. L., STEARN, J. E. F. and PIPER, J. D. A. (1983): Paleomagnetic studies of the Torridonian sediments, NW Scotland, *Scottish Journal of Geology*, **19**, pp. 29-45.

SNOKE, A. W. and TULLIS, J. (1998): An overview of fault rocks, in SNOKE, A. W., TULLIS, J. and TODD, V. R. (eds): *Fault-related rocks: a photographic atlas* (Princeton, New Jersey: Princeton University Press), pp. 3-18.

SOPER, N. J. and WILKINSON, P. (1975): The Moine thrust and the Moine nappe at Loch Eriboll, Scotland, *Scottish Journal of Geology*, **11**, pp. 339-59.

STEWART, A. D. (1978): Stoer and Loch Assynt (Torridonian) in BARBER, A. J., BEACH, A., PARK, R. G., TARNEY, J. and STEWART, A. D. (eds): *The Lewisian and Torridonian rocks of North-West Scotland*, *Geologists' Association Guide*, No. 21, pp. 27-35.

STEWART, A. D. (1982): Late Proterozoic rifting in NW Scotland: the genesis of the 'Torridonian', *Journal of the Geological Society of London*, **139**, pp. 413-20.

STEWART, A. D. (1990): The Torridonian Stac Fada Member: a discussion, *Transactions of the Royal Society of Edinburgh, Earth Sciences*, **81**, p. 247.

STEWART, A. D. (1997): Discussion on indications of glaciation at the base of the Proterozoic Stoer Group of Scotland, *Journal of the Geological Society of London*, **154**, pp. 373-76.

STEWART, A. D. (2002): The later Proterozoic Torridonian rocks of Scotland: their sedimentology, geochemistry and origin, *Geological Society Memoir*, **24** (London: The Geological Society).

STEWART, A. D. and IRVING, E. (1974): Palaeomagnetism of Precambrian sedimentary rocks from NW Scotland and the apparent polar wandering path of Laurentia, *Geophysical Journal of the Royal Astronomical Society*, **37**, pp. 51-72.

STRACHAN, R. A. (1986): Shallow-marine sedimentation in the Proterozoic Moine Succession, Northern Scotland, *Precambrian Research*, **32**, pp. 17-33.

STRACHAN, R. A., FRIEND, C., ALSOP, G. I. and MILLER, S. (2010): *A Geological Excursion Guide to the Moine Geology of the Northern Highlands of Scotland* (Edinburgh: Edinburgh Geological Society and Geological Society of Glasgow, with NMS Enterprises Limited Publishing).

SUTTON, J. and WATSON, J. V. (1951): The pre-Torridonian metamorphic history of the Loch Torridon and Scourie areas in the northwest Highlands, and its bearing on the chronological classification of the Lewisian, *Quarterly Journal of the Geological Society of London*, **106**, pp.

241-307.

SWETT, K. and SMIT, D. E. (1972): Cambro-Ordovician shelf sedimentation of western Newfoundland, north west Scotland and central east Greenland, *Proceedings of the 24th International Geological Congress*.

TANNER, P. W. G. and EVANS, J. A. (2003): Late Precambrian U-Pb age for peak regional metamorphism and deformation (Knory-dartian orogeny) in the western Moine, Scotland, *Journal of the Geological Society of London*, **160**, pp. 555-64.

TARNEY, J. (1973): The Scourie dyke suite and the nature of the Inverian event in Assynt, in PARK, R. G. and TARNEY, J. (eds): *The early Precambrian of Scotland and related rocks of Greenland* (Keele: University of Keele.), pp. 105-118.

TARNEY, J. and WEAVER, B. L. (1987): Mineralogy, petrology and geochemistry of the Scourie dykes: petrogenesis and crystallisation processes in dykes intruded at depth, in PARK, R. G. and TARNEY, J. (eds):

*Evolution of the Lewisian and comparable Precambrian high grade terrains*, Geological Society Special Publication, **27**, pp. 217-33.

TEALL, J. J. H. (1885): The metamorphosis of dolerite into hornblende-schist, *Quarterly Journal of the Geological Society of London*, **41**, pp. 133-45.

THIRLWALL, M. F. and BURNARD, P. (1990): Pb-Sr-Nd isotope and chemical study of the origin of undersaturated and oversaturated shoshonitic magmas from the Borralan pluton, Assynt, NW Scotland, *Journal of the Geological Society of London*, **147**, pp. 259-69.

THOMPSON, R. N. and FOWLER, M. B. (1986): Subduction-related shoshonitic and ultrapotassic magmatism: a study of Siluro-Ordovician syenites from the Scottish Caledonides, *Contributions to Mineralogy and Petrology*, **94**, pp. 507-522.

TORSVIK, T. and STURT, B. A. (1987): On the origin and stability of remanence and the magnetic fabric of the Torridonian Red Beds, NW Scotland, *Scottish Journal of Geology*, **23**, pp. 23-38.

TREWIN, N. H. (ed.) (2002): *The Geology of Scotland* (London: The Geological Society).

TURNBULL, M. J. M., WHITEHOUSE, M. J. and MOORBATH, S. (1996): New isotopic age determinations for the Torridonian, NW Scotland, *Journal of the Geological Society of London*, **153**, pp. 955-64.

VAN BREEMEN, O., AFTALION, M. and JOHNSON, M. R. (1979a): Age of the Loch Borrolan complex, Assynt and late move-ments along the Moine Thrust Zone, *Journal of the Geological Society of London*, **16**, pp. 489-95.

VAN BREEMEN, O., AFTALION, M., PANKHURST, R. J. and RICHARDSON, S. W. (1979b): Age of the Glen Dessarry syenite, Inverness-shire: diachronous Palaeozoic metamorphism across the Great Glen, *Scottish Journal of Geology*, **15**, pp. 49-62.

VANCE, D., STRACHAN, R. A. and JONES, K. A. (1998): Extensional versus compres-sional settings for metamorphism: garnet chronometry and pressure-temperature-time histories in the Moine Supergroup, north-west Scotland, *Geology*, **26**, pp. 927-30.

- WHITE, S. H. (1979): Grain and sub-grain size variations across a mylonite zone, *Contributions to Mineralogy and Petrology*, **70**, pp. 193–202.
- WHITE, S. H. (1980): On mylonites in ductile shear zones, *Journal of Structural Geology*, **2**, pp. 175–87.
- WHITE, S. H. (1998): Fault rocks from Ben Arnaboll, Moine Thrust Zone, Northwest Scotland, in SNOKE, A. W., TULLIS, J. and TODD, V. R. (eds): *Fault-related rocks: a photographic atlas* (Princeton, New Jersey: Princeton University Press), pp. 382–91.
- WHITE, S. H., EVANS, D. J. and ZHONG, D. L. (1982): Fault rock in the Moine Thrust Zone: microstructures and textures of selected mylonites, *Textures and Micro-structures*, **5**, pp. 33–61.
- WHITEHOUSE, M. J. (1989): Sm-Nd evidence for the diachronous crustal accretion of the Lewisian complex of northwest Scotland, *Tectonophysics*, **161**, pp. 245–56.
- WIBBERLEY, C. A. J. (2005): Initiation of basement thrust detachments by fault-zone reaction weakening, in BRUHN, D. and BURLINI, L. (eds): *High-Strain Zones: Structure and Physical Properties*, Geological Society Special Publication, **245** (London), pp. 347–72.
- WIBBERLEY, C. A. J. and BUTLER, R. W. H. (2010): Structure and internal deformation of the Arnaboll Thrust Sheet, NW Scotland: implications for strain localization in thrust belts, in LAW, R., BUTLER, R. W. H., HOLDSWORTH, R. E., KRABBENDAM, M. and STRACHAN, R. (eds): *Continental Tectonics and Mountain Building*, Geological Society Special Publication, **335** (London), pp. 319–22.
- WILKINSON, P., SOPER, N. J. and BELL, A. N. (1975): Skolithus pipes as strain markers in mylonites, *Tectonophysics*, **28**, pp. 143–57.
- WILLIAMS, G. E. (1969): Petrography and origin of pebbles from Torridonian strata (late Precambrian), northwest Scotland, in KAY, M. (eds): *North Atlantic - geology and continental drift: a symposium*, pp. 609–29.
- WILLIAMS, G. E. (2001): Neoproterozoic (Torridonian) alluvial fan succession, Northwest Scotland, and its tectonic setting and provenance, *Geological Magazine*, **138**, pp. 471–94.
- WILSON, R. W., HOLDSWORTH, R. E., WILD, L. E., McCAFFREY, K. J. W., ENGLAND, R. W., IMBER, J. and STRACHAN, R. (2010): Basement-influenced rifting and basin development: a reappraisal of post-Caledonian faulting patterns in the North Coast Transfer Zone, Scotland, in LAW, R., BUTLER, R. W. H., HOLDSWORTH, R. E., KRABBENDAM, M. and STRACHAN, R. (eds): *Continental Tectonics and Mountain Building*, Geological Society Special Publication, **335**(London), pp. 785–816.
- WOODCOCK, N. and STRACHAN, R. (eds) (2000): *Geological History of Britain and Ireland* (Oxford: Blackwell Science).
- WOOLLEY, A. R. (1970): The structural relationships of the Loch Borrolan complex, Scotland, *Geological Journal*, **7**, pp. 171–82.
- WRIGHT and KNIGHT (1995): A revised chronostratigraphy for the lower Durness group, *Scottish Journal of Geology*, **31**, pp. 11–22.

YOUNG, B. N., PARSONS, I. and THREAD-GOULD, R. (1994): Carbonatite near the Loch Borrallan Intrusion, Assynt, *Journal of the Geological Society of London*, **150**, pp. 945-54.

YOUNG, G. M. (1999): Some aspects of the geochemistry, provenance and palaeo-climatology of the Torridonian of NW Scotland, *Journal of the Geological Society of London*, **156**, pp. 1097-1113.

YOUNG, G. M. (2002): Stratigraphy and geo-chemistry of volcanic mass flows in the Stac Fada Member of the Stoer group, Torridonian, NW Scotland, *Transactions of the Royal Society of Edinburgh*, **93**, pp. 1-16.

ZHU, X. K., O' NIONS, R. K., BELSHAW, N. S. and GIBB, A. J. (1997): Lewisian crustal history from in situ SIMS mineral chronometry and related metamorphic textures, *Chemical Geology*, **136**, pp. 205-18.

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