

# Basement Complex of Orkney

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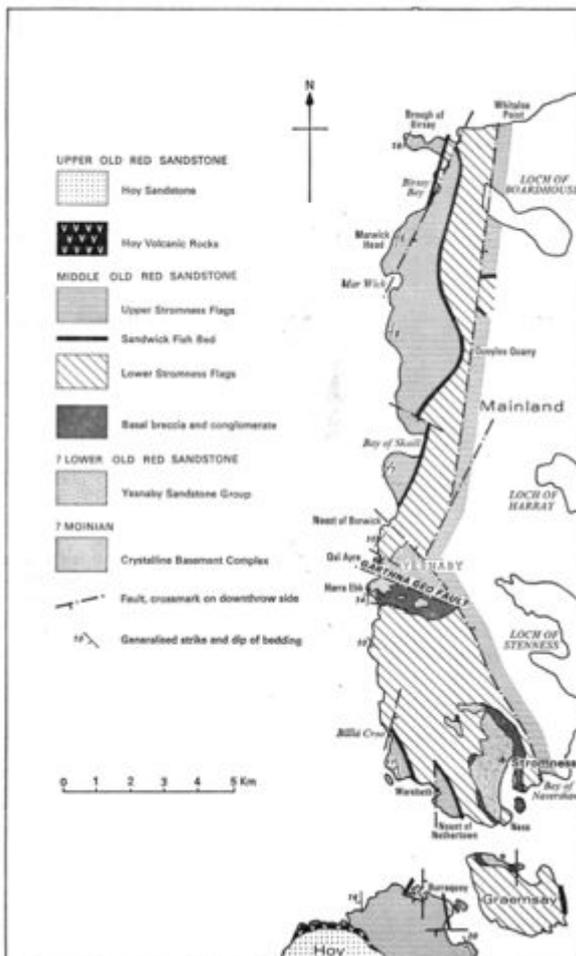
Mykura, W. 1976. British regional geology: Orkney and Shetland. Edinburgh, Her Majesty's Stationery Office.

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## Introduction



Geological map of the western seaboard of Orkney Mainland and northern Hoy. P915581.

The crystalline basement rocks of Orkney form a number of small inliers near Stromness, all of which lie along a north-north-west trending belt extending from Yesnaby to Graemsay ([P915581](#)). The largest outcrop forms the hilly ground just north of Stromness, which reaches a height of 96 m

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A high proportion of the basement is made up of coarse pink or greyish poorly foliated granite which locally grades into granite-gneiss. The granite contains enclaves of biotite-gneiss and smaller masses of siliceous, micaceous and hornblendic schist. Both the granite and included country rock are veined by fine-grained pink granite and by pegmatite. On Graemsay the included bodies of schist, which near the northern end of the island include hornblende- and pyroxene-schists, reach a size of several hundreds of metres. Within the Yesnaby inlier there are large masses of siliceous schist, and, on the shore just north of Harra Ebb (HY 217 150), hornblende- and biotite-schist.

No detailed structural or petrographic work has been done on the basement complex. Wilson (Wilson and others 1935<sup>[1]</sup>, p.15) suggested that the granite forms part of a deep-seated mass of which only the top is seen. He compared the metamorphic rocks with the Lewisian inliers found in the Moine of the Altnaharra district. In the southern inliers the coarse granite is generally slightly foliated and appears to pass in places into granite-gneiss, suggesting it forms part of the suite of older Caledonian granites.

A small outcrop of pale grey flow-banded porphyritic felsite can be seen on the promontory at the west side of the Bay of Navershaw ([P915581](#)) 1.5 km E of Stromness. This is unconformably overlain by a thin breccia which contains clasts of the felsite and passes laterally into Stromness Flags. It is not known if the felsite is itself underlain by Stromness Flags or if it forms part of the basement on which the flagstones rest. Wilson (in Wilson and others 1935<sup>[1]</sup>, p. 49) regarded it as a pre-Middle Old Red Sandstone rock, but Michie (in Gallagher and others 1971<sup>[2]</sup>, p. B 166) has suggested that it may be an ignimbrite of Lower Old Red Sandstone age.

## The pre-Old Red Sandstone land surface

Prior to the deposition of the Old Red Sandstone the basement inliers appear to have formed an arrangement of hills which was elongated in a north-north-westerly direction. The present topography of the inliers appears to be much the same as it was at the time of their burial, and small patches of sediment can still be found on the hill tops of Yesnaby and Graemsay. The original hills may not have been more than 100 m high and the original average gradients of their slopes did not normally exceed 13°, but there is ample evidence for the presence of small cliffs, knolls and gullies. The granite and metamorphic rock underlying the exhumed surface is everywhere fresh and there is no sign of any deeply weathered profile.

## Bibliography

### [Full bibliography list](#)

1. ↑ <sup>[1]</sup> <sup>[2]</sup> WILSON, G. V., EDWARDS, W., KNOX, J., JONES, R. C. B. and STEPHENS, J. V. 1935. The Geology of the Orkneys. Mem. geol. Surv. Gt Br.
2. ↑ GALLAGHER, M. J., MICHIE, U. McL., SMITH, R. T. and HAYNES, L. 1971. New evidence of uranium mineralization in Scotland. Trans. Inst. Min. Met., 80, B150-173.

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