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## Deer Park

[SM 756 091]–[SM 760 088]

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### Introduction

Lavas, pyroclastic rocks and high-level intrusive rocks of the Skomer Volcanic Group, of Llandovery age, crop out intermittently over 40 km of a near-strike section in south Pembrokeshire. Offshore, the volcanic rocks form The Smalls in the west, the reef known as the Hats and Barrels, and Grassholm, as well as much of Skomer Island, and Middleholm (Midland Island); onshore, they crop out across the Marloes Peninsula as far east as St. Ishmael's (Figure 6.69), although exposures are scattered and poor. The thickest and best exposed development of the volcanic rocks is seen on Skomer Island (see the Skomer Island GCR site report), while exposures in the rugged coastline of the Deer Park Peninsula, at the Deer Park GCR site, provide critical evidence for the age of the group, which represents the most important episode of Silurian volcanism in the southern Caledonides of the British Isles. Broad details of the Skomer Volcanic Group are described in the Skomer Island GCR site description.

Volcanic and related rocks are well exposed all around the coast of the headland known as Deer Park, from Martin's Haven to Renney Slip (Figure 6.72). Access, however, is for the most part difficult; the easiest access is in the vicinity of Wooltack Point and at Renney Slip.

### Description

Basic to intermediate lavas are the most common volcanic rocks at Deer Park, as indeed they are on Skomer Island. Some 45 m of thin (c. 5 m-thick), generally massive flows crop out on the headland, in places showing reddened tops and bases. These flows have been correlated with those exposed on Skomer Island in the vicinity of North Haven and South Haven (Ziegler *et al.*, 1969), and are chiefly hawaiites and mugearites (Thorpe *et al.*, 1989). Locally, as at Jeffrey's Haven, the lavas are pillowed. Petrographically, they are identical to the lavas exposed on Skomer Island, being fine grained, greenish-grey in outcrop and commonly vesicular. Under the microscope they are seen to be sparsely porphyritic, containing plagioclase, clinopyroxene, Fe-Ti oxide and rare olivine microphenocrysts in a fine-grained matrix dominated by plagioclase microlites, some showing flow alignment.

Silicic rocks are rare in the Deer Park section. However, a 5.5 m-thick ash-flow tuff exposed at Jeffrey's Haven, has been correlated with the 'Skomer Ignimbrite' which crops out at the southern end of the Skomer Island section (see the Skomer Island GCR site report) and on Middleholm (Midland Island). This ash-flow tuff forms an important stratigraphical marker within the Skomer Volcanic Group. Ziegler *et al.* (1969) presented major element chemical analyses of the ash-flow tuff from this locality, but no trace element analyses are available; hence it is not possible to ascribe this unit to either of the two silicic groups identified by Thorpe *et al.* (1989).

The key section for establishing the age of the Skomer Volcanic Group occurs to the south of Anvil Bay, although much of the sequence in this area is made up of sedimentary rocks. Here a 7 m-thick basalt flow, which is vesicular both at its base and top, is exposed at Limpet Rocks and extends eastwards across the promontory dividing Anvil Bay from Renney Slip. The sequence is much faulted around the bay; sedimentary beds immediately overlying the basalt are best exposed in the steep dip faces forming the north side of Renney Slip. Faunas contained within this sedimentary sequence are indicative of an early Upper Llandovery (late Aeronian, C<sub>1-2</sub>) age (Walmsley and Bassett, 1976; Bassett, 1982). The unconformity at the top of the Skomer Volcanic Group is exposed on the SE side of Renney Slip.

### Interpretation

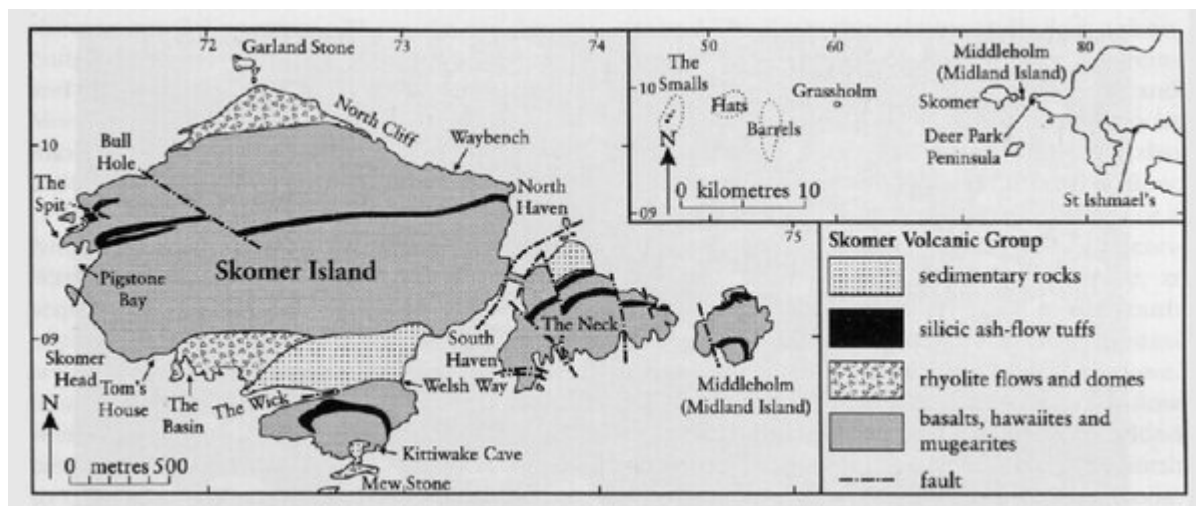
The basic to intermediate lavas exposed across the site area are lateral equivalents of the lavas exposed on Skomer Island, and form a part of the Skomer Volcanic Group. Predominantly they were erupted in a subaerial environment, although locally they were either erupted or emplaced subaqueously. Silicic rocks are rare across the site area, restricted to the single occurrence of an ash-flow tuff to the south of Jeffrey's Haven. This unit has been correlated with similar rocks exposed towards the top of the sequence exposed on Skomer Island; however recent work has identified a number of ash-flow tuffs on Skomer Island, at various stratigraphical levels and with contrasting chemistries (R.E. Bevins and G.J. Lees, unpublished data), and hence the correlation is in need of reappraisal.

The volcanic rocks of the Skomer Volcanic Group are part of a basalt–hawaiite–mugearite–comendite series. Thorpe *et al.* (1989) presented the most recent interpretation of the geochemistry of the volcanic rocks of the group (see the Skomer Island GCR site report).

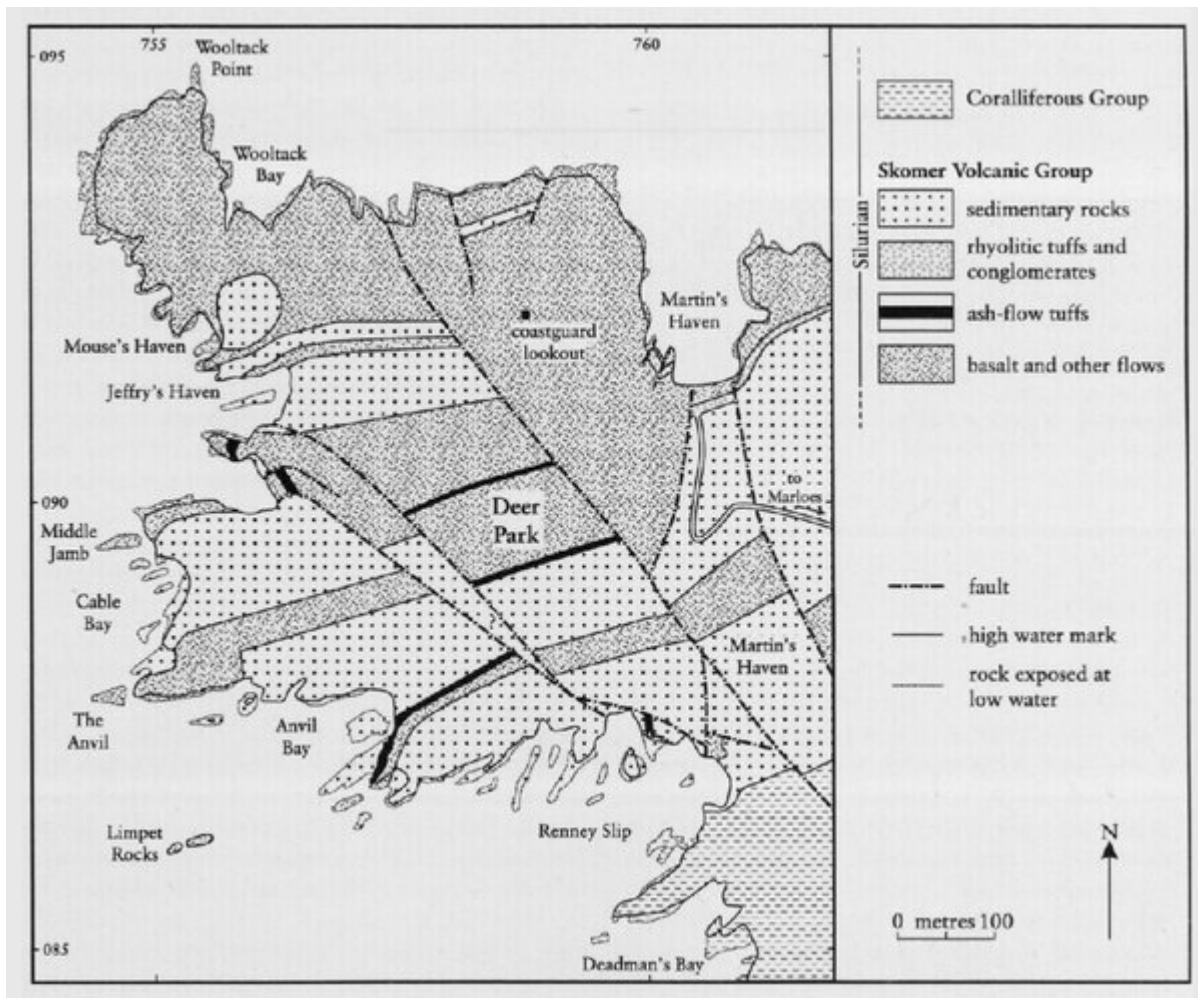
## Conclusions

The Deer Park site exposes lavas and pyroclastic rocks of the Skomer Volcanic Group, along with associated sedimentary rocks. This sequence represents the most important episode of Silurian volcanism in the southern part of the British Caledonides. The Skomer Volcanic Group is best exposed on Skomer Island itself (see the Skomer Island GCR site report); however, coastal outcrops in the Deer Park area provide critical evidence for the true age of activity, based on fossils indicative of the Upper Llandovery. This volcanic sequence therefore represents the youngest volcanic episode of importance in the southern Caledonides of the British Isles.

## References



(Figure 6.69) Map of Skomer Island (after Ziegler *et al.*, 1969).



(Figure 6.72) Map of the Deer Park Peninsula (after Ziegler et al., 1969).