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Short note
New observations about the Latady basin from the Orville Coast, Antarctic Peninsula

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Introduction

A series of small cliffs on the south-eastern side of Dodson Peninsula, Orville Coast (Fig. 1) are the most remote rock exposures in the south-eastern extremity of the Antarctic Peninsula. Never previously visited, the opportunity to approach the exposures was taken during oversnow seismic investigations in January 1993. They are located 8–25 km south-west of Cape Cox, and face onto Ronne Ice Shelf. The closest previously studied exposures are rocks of the Upper Jurassic Latady Formation, on the north-west side of Dodson Peninsula in Hansen Inlet. The Latady Formation is a thick sequence of mostly thin- to thick-bedded mudstone and sandstone, thought to be a back-arc basin sequence (Rowley *et al.* 1983, 1992). If the Cape Cox exposures are also of Latady Formation rocks, then their significance lies in the control they provide to models of the shape and size of the Latady basin.

The cliffs were first identified by aerial photography and marked on the *Antarctica Sketch Map, Ellsworth Land-Palmer Land* (U.S.G.S. 1969). Access from the landward side appeared dangerous and in order to visit them, the coastline was approached on foot from the Ronne Ice Shelf. This entailed the negotiation of a broad zone of crevasses produced as the ice shelf shears past Dodson Peninsula (Fig. 1). About 1.5 km south-east of the foot of the cliffs however, the crevasses became so chaotic that further progress was deemed too hazardous. Observations were therefore made from a point located (using a satellite navigation receiver) as 75°27.71´S, 63°15.23´W (Fig. 1). The exposures closest to this point had aprons of avalanche debris beneath them and seracs above.

Observations

Figure 2 is a field sketch of the exposure closest to the observation point. The rocks in the cliff were of two colours, dark grey and light buff. Bedding has an apparent dip of 15°SW, with a small dip component into the face. The dark grey rock forms the lowest and highest parts of the face with the buff material between them. The buff rock formed a steeper face than the dark material, as seen on the most northerly outcrop, which presented a profile to the observation point. The base of the buff rock had the form of one half of a large U-shaped channel. The channel appeared to be

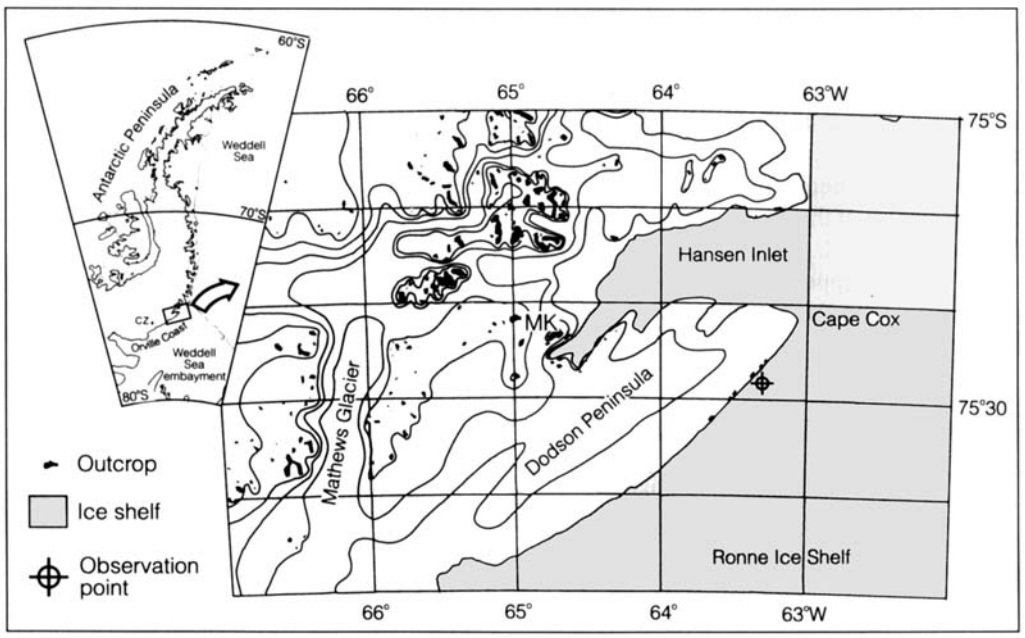

Fig. 1. Location map. MK = Mount McKibben, CZ (inset) = Cape Zumberge.

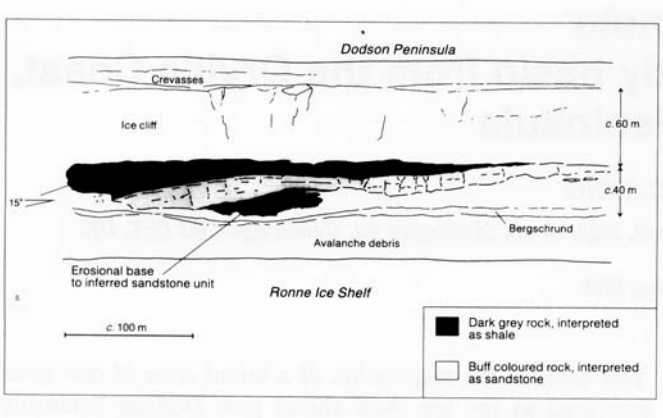

Fig. 2. Field sketch of outcrop.

erosional, for it truncated bedding within the grey rock. The channel was estimated to be at least 100 m across and 10 m deep. The top surface of the buff unit is conformable with the bedding above it.

Interpretation

The dark grey rock is interpreted as a shale sequence. The sequence is mostly thinly bedded but contains locally thicker beds that have a slightly lighter colour. The buff rock is interpreted as a massive sandstone, probably deposited as a channel fill. Whether the channel is part of a near-shore deltaic sequence or part of a deeper water fan or part of some other depositional environment is not known. The nearest exposures to the north-west are sandstones and shales of the Latady Formation, the most likely interpretation is that the Cape Cox exposures belong to the same formation.

Discussion

Laudon *et al.* (1983) suggested that the general progression in environments within the Latady Formation is from terrestrial, near the axis of the Antarctic Peninsula, through near-shore marine, possibly deltaic, to shallow, open marine near the present coast. They cited nunataks composed entirely of soft, black, fissile shale at Cape Zumberge and south of Mount McKibben (Fig. 1) as examples of the later. Rowley *et al.* (1983) suggested that these rocks were deposited offshore, below effective wavebase and it would appear that the basin deepened to the south-east, away from a shoreline lying parallel to the long axis of the Antarctic Peninsula. In this case the outcrop near Cape Cox would be expected to be of finer grained, open marine rocks because of it's location further outboard of the Mount McKibben and Cape Zumberge exposures. If the Cape Cox exposures were to prove to contain a channel-fill sandstone from a near-shore deltaic sequence, then the simple palaeogeography described by Laudon *et al.* (1983) and Rowley *et al.* (1983) would need to be revised. Interpretation of seismic data from the Weddell Sea embayment shows a sedimentary basin 12–15 km deep (Kadmina & Kurinin 1983, Hübscher 1995) with a zone of compressional structures observed about 80 km south-east of Cape Cox (King & Bell 1996). If there is a link between the onshore exposures and the sedimentary rocks interpreted from the seismic data then the Latady Formation may contain a record of the early rifting history of the Weddell Sea embayment. Lithological data are required from the Cape Cox exposures to determine the depositional environment and the provenance of the rocks. Whether these rocks were deposited in a near-shore or deeper water setting and whether they derive from the arc or the craton has significant implications for the extent and form of the Latady basin.

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