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# Pease Bay to Cove

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O.S. 1:50000 Sheet 67 Duns & Dunbar

B.G.S. 1:50000 Sheet 34 Eyemouth

Route: (Map 17)

## Introduction

The Pease Bay to Cove sequence presents a conformable succession passing up from Upper Old Red Sandstone facies into Carboniferous facies of the Calciferous Sandstone Measures. This transition almost certainly lies well above the Carboniferous-Devonian boundary for, though the first marine bands contain the oldest fully marine horizons in the Scottish Carboniferous, they are of Asbian age, well up in the Visean. These bands indicate the beginning of the end of desert-fluvial conditions which had persisted from the early Devonian. and in central Scotland since the middle Silurian (Mykura, Francis in Craig 1983).

Pease Bay, a sandy bay dramatically rimmed by Upper Old Red Sandstone cliffs, lies some 1.5 km off the A 1 at Cockburnspath. The nearest bus is Perryman's bus service number 253 which operates a seven day service from Edinburgh to Berwick upon Tweed which stops at Cockburnspath. Cars and coaches can be taken with care from the village and down the very steep 300 m track to the car park by the ford before the Pease Bay Caravan Park. The excursion is 2 km along the shore, taking a good half day.

The strata, well exposed in the foreshore and cliff sections, have a general dip to north or NNW, commonly 20° but increasing to 60° when affected by faulting. The succession, modified from Clough et al. (1910), is numbered according to the localities to be visited:

		metres
13	Bilsdean Sandstone	14
12	Mudstone with 0.3 m thick Cove Oil-shale	20
11	Cove Harbour Sandstone	26
	Sandstone and shale	8
10	Cove Upper Marine Band	0.4
	Sandstone, mudstone. Clay, seatclay	19
10	Cove Lower Marine Band	0.4
	Sandstone, mudstone, clay. seatclay with <i>Cardiopteris</i> shale-band	32
9	Heathery Heugh Sandstone	55
8	Purple-red and grey marls. including thin coals	32
7	Kip Carle Sandstone (Strata cut out by Cove Fault) Cementstone, conglomerates, sandstone, shales, greenish and purplish cementstones	25+
6	Horse Road Sandstone	43
5	Calcareous sandstone band with <i>Sanguinolites</i>	0.4
	Cementstone and shale	17

4	Eastern Hole Conglomerate	0.4
1–3	Upper Old Red Sandstone (cornstones and cross-bedded red sandstones)	80+

## 1. Greenheugh Point [NT 799 710] Upper Old Red Sandstone

There is a good sequence of upper Old Red Sandstone sediments to the east of Pease Bay. Approximately 1 km from the bay a large fallen block was found crowded with largely intact specimens of the fish *Bothriolepis* which had been trapped in a drying-out pond. Much of this material is preserved in the Royal Museum of Scotland.

## 2. Deil's Hole: Upper Old Red Sandstone

Across the sands, the high red cliff at the northern end of Pease Bay is composed of alternating laminar and cross-bedded red sandstones, dipping 17°N. At the base is fine trough cross-stratification, the troughs trending southwards and visible both in section and from the upper surface. These beds were rapidly deposited by fast-flowing currents in distributary channels which frequently eroded earlier filled channels. The intervening layered sediments with green reduction spots in places, are flood-plain deposits.

## 3. Hawk's Heugh: Upper Old Red Sandstone

Round the headland and across the next small bay another high cliff stands above an extensive wave-cut platform. The horizontal red sandstones at the base exhibit numerous bands and patches of bright red nodules. These cornstones are secondary and resulted from caliche soil formation. During evaporation after rare episodes of rainfall, calcium and bicarbonate ions migrated vertically to form a hard surface of carbonate clots. Such calcrete surfaces may be washed out and redeposited by later desert floods. The red colour is secondary hematite.

## 4. Eastern Hole Conglomerate

The top of the Old Red Sandstone facies lies beyond the next headland; and the basal unit of the Carboniferous is here taken at the base of the Eastern Hole Conglomerate. This is a cementstone horizon with conglomeratic layers containing yellow angular clasts of dolomite, together with fish scales and spines.

## 5. Sanguinolites band

Overlying the conglomerate is a 25-cm band, not very clearly seen amongst the pebbles, containing coalified plant fragments and stems (*Lepidodendron*) and the bivalve *Sanguinoides*, with rare ostracods and fish scales. This band is succeeded by a grey siltstone bed forming a ridge about 2 m high in which excellent climbing ripples are displayed. The crests of these ripples, migrating eastwards, can be followed through successive layers, testifying to very rapid deposition of voluminous sediments in a fast-flowing current.

Do not hammer these exposures.

## 6. Horse Road Sandstone

The pale grey-green Horse Road Sandstone is largely false-bedded and shows many slump-structures; good examples of these can be collected in pebbles. The top of this sandstone forms a small headland at the north end of Eastern Hole. Very large concretions up to 1.5 m diam. in the sandstone. are visible in the cliff face, while others have worked loose and form giant round pebbles. Secondary concretions can be seen within some of the larger concretions. In the bay beyond, some of the strata above the Horse Road Sandstone are cut out by the WSW–ENE trending Cove Fault with a down throw to the north.

## 7. Kip Carle Sandstone, Cove Fault

The pale brown medium to coarse grained Kip Carle Sandstone forms the next prominent high point across the bay, where it dips very steeply due to the drag effects of the Cove Fault. The fault can also be seen running from the base of this high point across the next bay, where it forms a marked inclined gully and a fault-breccia in the opposite cliff.

## 8. Scremerston Coal Group?

Beyond the sandstone the beds are thrown almost vertical by the faulting. A cyclical sequence of thin coals and seatclays separated by sandstones may be equivalent to the Scremerston Coal Group of Northumbria. Below one of the coals is a ganister, a hard white seatrock in which the rootlets of coal-forming plants can be seen.

## 9. Heathery Heugh Sandstone

The last cliff before Cove Harbour is formed by the red-stained Heathery Heugh Sandstone, through which a narrow gap leads to the harbour. Some of the sandstone is slumped, but the upper part is formed of successive cross-stratified units, well displayed in gullies on the south side of the harbour.

## 10. Cove Harbour

In the harbour, shales and sandstones dip some 40° to the north. A band containing the excellently preserved seed fern *Cardiopteris polymorpha* (Figure 18) is present but this together with the succeeding Cove Marine Bands is not easily found. With respect to the harbour wall, the Cove Lower Marine Band is the more easily found, outcropping 10 m south of the angle in the harbour wall; the fossils are found in layers through some 2 m of strata. Crinoid ossicles are dominant, whilst other fossils are fragmentary, including sanguinolitid and nuculid bivalves and the brachiopods *Productus redesdalensis*, *Punctospirifer scabricosta*, and *Composita*. The Cove Upper Marine Band can be found at low tide close to the harbour wall. It is about 1 m thick and is mainly shaly with impure limestones; the brachiopod *Punctospirifer scabricosta* is common, as is the bivalve *Aviculopecten*.

A full list of fossils is given by Wilson (1952) including those from nearby inland exposures of the Cove Lower Marine Band. An Asbian (B) age is given by the goniatite *Beyrichoceratoides redesdalensis*.

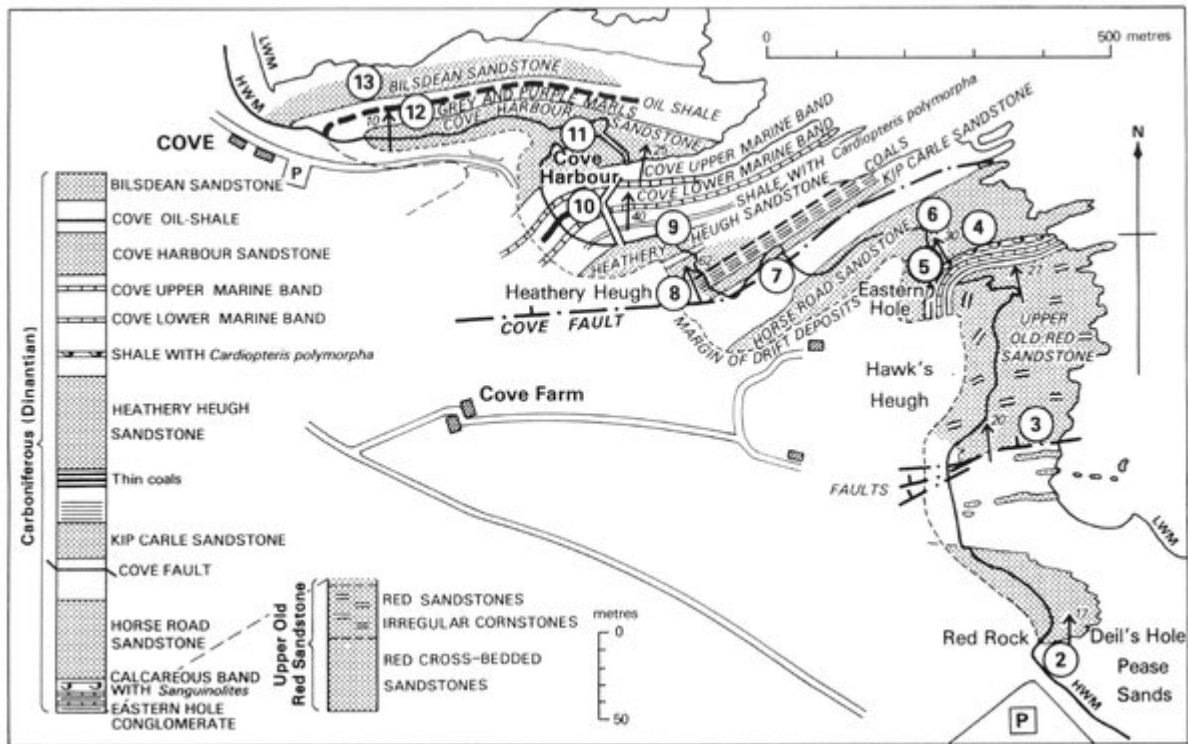
## 11. Cove Harbour Sandstone

Ascend the path behind the harbour through the tunnel cut in the Cove Harbour Sandstone, to the village of Cove. The sandstone is purplish-red, yellow in places, false-bedded and rather coarse. There are abundant lenticles of deep-red and buff sandy shale near the base of the upper half. This sandstone marks a temporary return to desert-fluvial conditions.

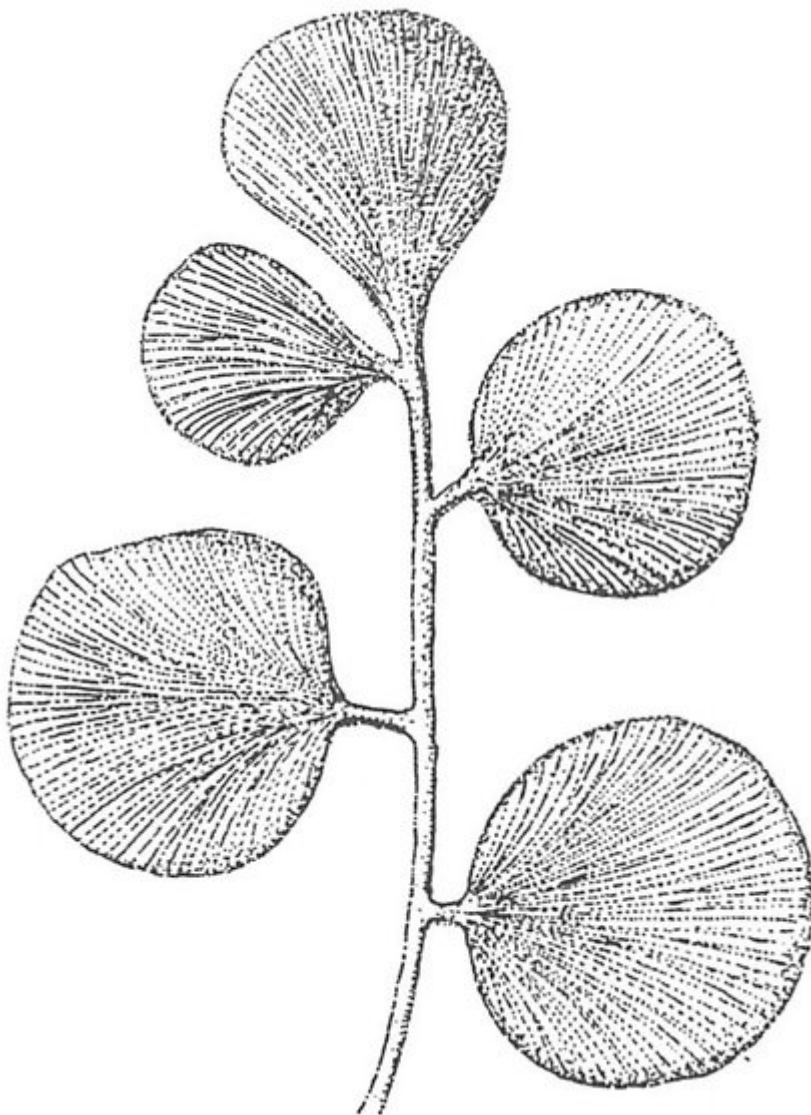
## 12, 13. Cove Oil-Shale and Bilsdean Sandstone

The higher beds north of Cove are not easily accessible, but are well seen from the cliff-top car park at Cove village. In the bay, green and purple marls 6 m thick are overlain by the 30 cm Cove Oil-shale which can be traced westwards for about 500 m, dipping north at 10–15°. The uppermost beds that can be seen, belong to the yellow, fine-grained and evenly bedded Bilsdean Sandstone. Return to Cockburnspath via Cove or to Pease Bay.

## [References](#)



(Map 17) Pease Bay to Cove.



(Figure 18) *Cardiopteris polymorpha*.