Catcraig

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

B.G.S. 1:50000 Sheet 33E Dunbar

Route: (Map 16)

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Introduction

The fine coastal section at Catcraig exposes the Dinantian limestone-bearing strata of the Lower Limestone Group and the topmost Calciferous Sandstone Measures. The sediments are cyclical with the thick fossiliferous limestone and calcareous mudstones overlain by deltaic mudstone-siltstone-sandstone sequences and underlain by a thin coal or coal position on a seatearth. The Calciferous Sandstone Measure-Lower Limestone Group boundary is taken at the base of the Upper Longcraig Limestone. The beds below belong to the Brigantian Stage (P_1) and the VF miospore zone, the higher beds to the P_2 goniatite zone and the F-NC miospore zone (Francis *in* Craig 1983. Davies in Anon. 1972).

The general succession at Catcraig is:

	Lower Limestone Group: Massive current-bedded sandstone	metres
8,9	**Barns Ness Limestone (= Dryburnfoot Limestone)**	1
	mainly sandstone, mudstone	10
7	**Chapel Point Limestone**	3
	Coal horizon and seatclay	0.2
	Sandstone, mudstones, And obscured strata	27
6	**Upper Skateraw Limestone**	0.5
	Calcareous mudstone	1.5
5	**Middle Skateraw Limestone**	4
	Thin coal and seatclay	0.1
	Mudstone	3
4	**Lower Skateraw Limestone**	1
	Sandstone and mudstone	5
3	**Upper Longcraig Limestone**	6
	Calciferous Sandstone Measures	
	Thin coal and seatclay	0.1
	Mudstone	2
2	**Middle Longcraig Limestone**	1.2
	Sandstone	1.5
	Mudstone	0.5
1	**Lower Longcraig Limestone**	

The beds lie south of the Southern Upland Fault in the Dunbar Basin. They have a gentle dip to the cast, complicated by minor faulting. Because the limestones are accessible they were worked from the late 18th century and burnt for agricultural lime at the Catcraig Limekiln. Now they are exploited in the huge opencast quarries to supply the Dunbar Cement Works of Blue Circle Industries plc whose chimney and kiln dominate the skyline. It is the Upper Longcraig and Middle Skate raw Limestones that are used together with some of the intervening mudstones. Geological visitors wishing

to study the excellent sections in the opencast site should write to the General Works Manager.

Access to the coastal section is obtained from the new A1 road. Turn seaward at the west end of the cement works, signposted East Barns. Turn right along the old A1 taking either the first left to the White Sands car park or second left to Barns Ness Lighthouse caravan site and car park. The area has been laid out as a nature trail by East Lothian District Council. A booklet is available and explanatory notices and geological maps are displayed in the limekiln (Figure 17). The limestone horizons can be located by concrete marker-pillars. numbered as in the above section. The starting point for the excursion is at the old Catcraig limekiln. The excursion takes at least half a day, longer if detailed collecting is included, and is preferably done when the tide is not high.

1. Lower Longcraig Limestone

This limestone is not exposed in the section but is well-known from boreholes.

2. Middle Longcraig Limestone

The lowest beds in the section are secn opposite the old limekiln where the Middle Longcraig Limestone forms an extensive wave cut platform along the shore. This light-grey, highly nodular and often crinoidal limestone has in places a yellow dolomitised upper surface marked by possible glacial striations subparallel with the shore. The limestone rests on sandy beds. seen near the water outlet at the western end of the section. in which the trace fossil *Zoophycos* and U-shaped tubes occur.

The Middle Longcraig Limestone contains excellent specimens of the corals *Lithostrotion junceum* and *L. pauciradiale* particularly near the hydraulic ram, along with the brachiopods *Eomarginifera*, *Spirifer* and *Composila*, with bryozoan debris between the nodules. The upper surface of this limestone is indented with striking basin-shaped hollows about 1 m across and more-or-less evenly spaced. These potholes are of Carboniferous age since they are partially filled in by overlying fireclay and might represent the sites of now-vanished Carboniferous forest trees. The absence of the deltaic part of the cycle might be partly responsible for this. The thin coal seam can be seen in the low cliff, with Stigmaria and rootlets visible in the seatclays.

The overlying mudstone forming an elongated shelf has beds rich in the productoid brachiopod *Eomarginifera* and the bivalve *Streblopteria*. Other horizons have copious debris of small crinoids.

3. Upper Longcraig Limestone

The 6 m thick pale grey Upper Longcraig Limestone, above the mudstone, is exposed along the shore. A band, 25 cm thick, about 1 m below the top of the limestone, composed entirely of the coral Koninckophyllum, is readily distinguished. This limestone is also exposed inland, in the quarries near the limekilns, where it is very hard, dolomitised, and in places highly brecciated. Irregular undulating surfaces occur within the limestone and some surfaces are covered with dolomite crystals. The overlying mudstone contains plant fragments.

From the hydraulic ram can be seen standing up as a distinct wall resembling a dyke, a dolomitised fault striking 54°E. The fault is of small displacement and is not dolomitised continuously along its length. Close to the fault some very large crinoid stems are exposed on the surface of the limestone.

4. Lower Skateraw Limestone

The Lower Skateraw Limestone, only about a metre thick, is seen on the shore just south of the small headland. It is medium to brownish-grey and fine-grained. Crinoid ossicles are abundant and the limestone is distinguished by the presence of Gigantoproductus. Overlying this is a poorly exposed mudstone, seatearth and coal sequence.

5, 6. Middle and Upper Skateraw Limestones

The next cycle begins with the distinctive Middle Skate raw Limestone, which forms a broad shelf below the east car park. This 4 m thick limestone is crinoidal and often nodular. It is distinguished by a 25 cm thick band with innumerable specimens of the foraminiferid *Saccaminopsis* seen as orange or brown spheres 2–3 mm in diameter with a calcitic infilling. Colonies of the flat and discoidal or bun-shaped stromatoporoid *Chaetetes* may be seen at the base of the limestone.

The calcareous mudstone above the Middle Skate raw Limestone is replete with ironstone nodules and is exceptionally fossiliferous with abundant brachiopods, especially *Eomarginifera*, bivalves, the trilobite *Paladin eichwaldi*, solitary corals (including some type species) and crinoid stems and plates, Plates of the crinoid *Parazeacrinites konincki* from this locality were the subject of a detailed taphonomic study by Whyte (1973. 1982), According to Whyte this mudstone and the overlying Upper Skateraw Limestone formed a current-influenced NW–SE trending mudbank with a palaeorelief of up to 20 m. The Upper Skateraw Limestone (6) is pale brown on weathered surfaces. It is here only 50 cm thick and poorly exposed. It contains many hematised nodules.

In the bay to the east the beds above the mudstones are obscured by beach deposits. Towards the lighthouse are ledges of thin sandstone interleaved with fissile mudstone, with abundant surface grazing traces. Rare septarian nodules are present in the mudstones.

7. Chapel Point Limestone

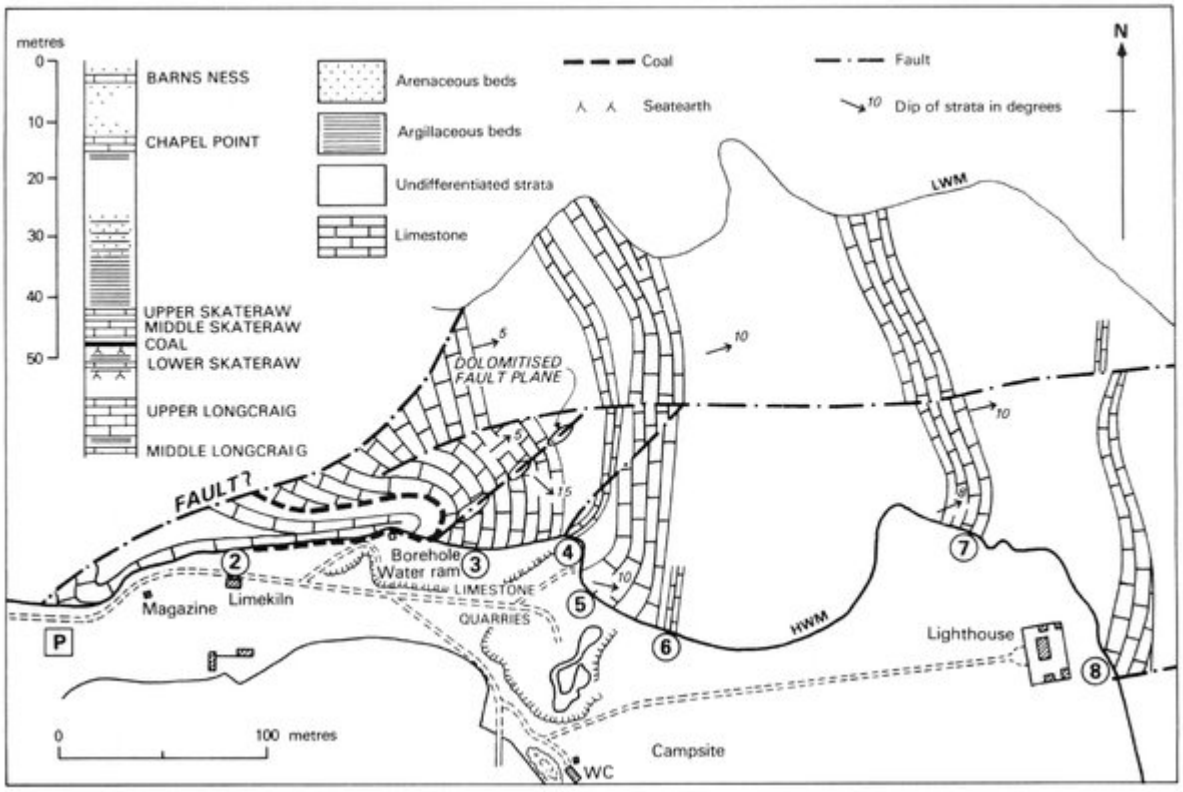
The 3 m thick Chapel Point Limestone which begins the next cycle is encountered west of the lighthouse. It is brownish yellow, highly crinoidal, heavily bioturbated and marked by a diverse succession of abundant trace fossils. Towards the base are numerous *Rhizocorallum*, U-shaped horizontal traces up to 50 cm long, and often of sinuous form. Above these are concentric swirling 'cocks-tails' of *Zoophycos cauda-galli*, the grazing traces of some unknown invertebrate. At some horizons are the open horizontal burrows, sometimes branched, of *Thalassinoides*, together with some fan-shaped traces. At the top of the limestone, as it grades into the overlying sandstone, are giant vertical U-shaped tubes of *Diplocraterion*.

8, 9. Barns Ness Limestone, Dryburnfoot Limestone

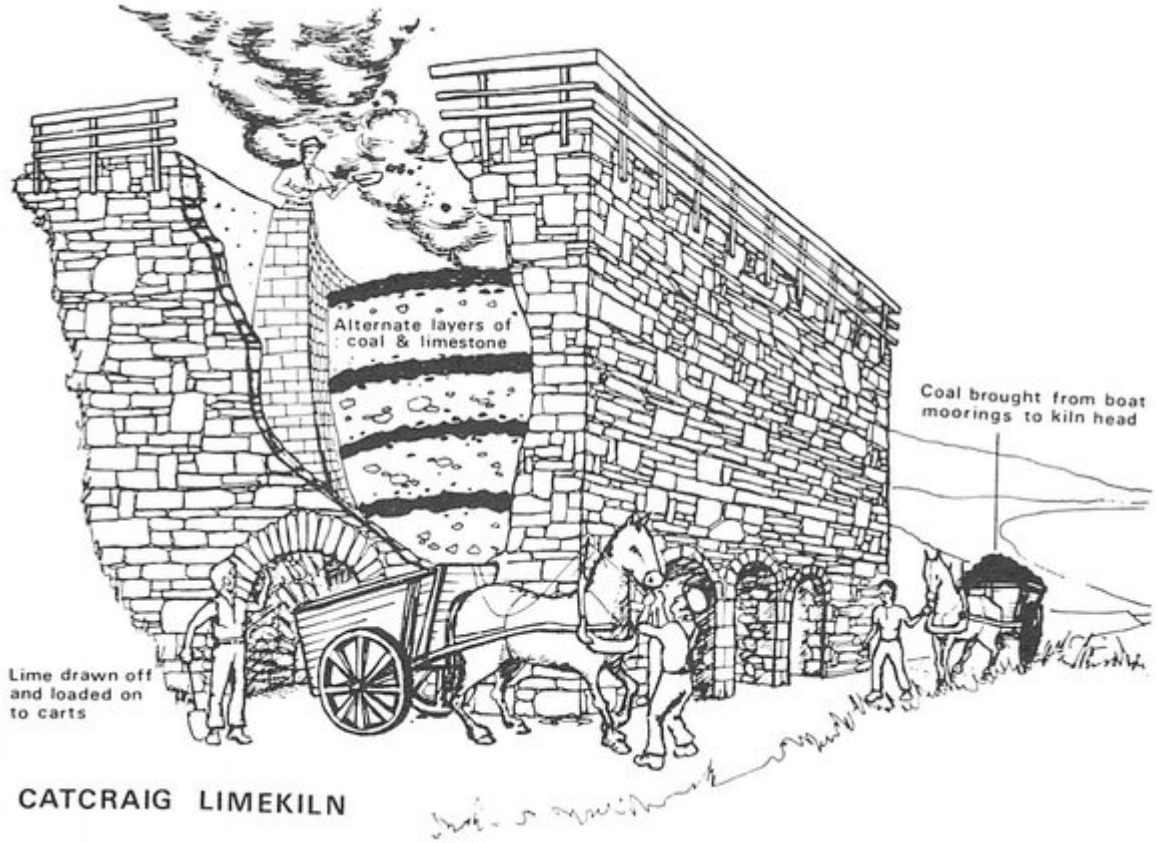
Overlying the Chapel Point Limestone on the shore opposite the lighthouse is a thick sandstone sequence which includes a sandy limestone, the Barns Ness Limestone. Borehole evidence suggests that this and the Dryburnfoot Limestone are the same and not separate horizons. The sandstones, coarse to fine, are often current-bedded with large spherical concretions, probably marking a deltaic influx over a shallow nearshore lime-mud sea.

The pipeline east of the lighthouse marks a convenient limit to this excursion.

References



(Map 16) Catcraig.



(Figure 17) Catcraig Limekiln from 'Barns Ness', Anon 1972.