

# Geo of Inganess, Point of Buckquoy, Whitaloo Point, Orkney - an excursion

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## Locality 1 Geo of Inganess (HY 219 413) to Borwick (HY 220 167)

Possible Lower ORS age sediments occur at Yesnaby and around the hill of Crua Breck (HY220150) . Two formations, of (?) Lower ORS age, the Harra Ebb Formation and the Yesnaby Sandstone Formation, are exposed around the flanks of an exhumed hill of granites, gneiss and schists . The Harra Ebb formation comprises breccias, conglomerates and pebbly, arkosic sandstones which formed as talus and scree deposits flanking the hill. On the northern side of the hill these are faulted against the Yesnaby Sandstone Formation. Both formations are unconformably overlain by Lower Stromness Flagstones with local conglomerates at the base. The Harra Ebb Formation/Lower Stromness Flagstone Formation unconformity, with an angular discordance of 6-10°, is well exposed at Kaellan Hellier (HY219145) and the Yesnaby Sandstone Formation/Lower Stromness Flagstone Formation unconformity (angular difference 10°) at the Old Millstone Quarry at the point of Qui Ayre (HY 217 155).

Two facies are recognized in the Yesnaby Sandstone Formation. The lower facies (Facies I), at least 30m thick, consists of rusty weathering (with ferroan calcium and magnesium carbonate cements) grey, fine-medium grained well sorted sandstones with well rounded grains. Large scale, mainly tabular cross bedding is developed and is well exposed (though inaccessible), on the cliff face. The foresets are steeply inclined and individual sets vary between 1-3m. Major bedding planes, originally believed to have been horizontal (and now dipping about 14°) are spaced 5-6m apart and truncate the cross bedding. These are believed to be aeolian deposits derived from the west or north west.

The well sorted and cross bedded aeolian sediments pass up into Facies II consisting of massive, flat and ripple bedded sandstones with thin suncracked horizons at least 25m thick . These are interpreted as beach and nearshore deposits representing a water body which advanced from the south and inundated the dunes. The whole succession can be seen around the Noust of Bigging (HY 219 158) but it is complicated by faulting.

At Harra Ebb there is a spectacular stack of breccia, composed of blocks of sandstone set in a matrix of comminuted calcareous gritty sediment. On the foreshore a further five oval shaped breccia masses are seen in plan. These appear to be small volcanic crypto-vents, formed by gas-fluxion, probably at the time when camptonite dykes of the area were emplaced.

The possible Lower ORS sediments are overlain by Lower Stromness Flagstones which are well exposed along the cliff top northwards towards the Hill of Borwick. The section includes spectacular beds of stromatolites known locally as 'Horse-Tooth' stone.

## **Locality 2 Point of Buckquoy (HY 247 283) to Broch of Birsay (HY 240 285)**

On the north shore of the [Point of Buckquoy](#) there is a continuous section from east to west (beds dip at 20° to WNW) from the highest beds of the Lower Stromness Flags through the Sandwich Fish Bed (HY247283) into the overlying "Hoy Cycles". The Sandwich Fish Bed contains two leaves of the deep-water 'laminate' facies within the cycle, indicating a temporary regression of the water in the extensive lake in the north-western corner of Orkney Mainland.

The lowermost deepwater rhythmite unit contains the thin calcium carbonate rich horizon, near the base, seen in the sections to the south. The main fish bearing horizon is also present approximately 2.5m above

the base of the cycle, again as in the southern localities. The rhythmites pass upwards into shallower water interbedded and commonly slumped siltstones and ripple bedded sandstones. Twenty metres above the base however the rippled sandstones largely disappear and slumped and interlaminted silstones reflect the deepening water. The appearance of euxinic rhythmite deposits at about 30m indicated that stratified lake waters again covered the area, but the shallowing sequence quickly follows with the appearance of suncracked horizons and channel sandstones representing lake margin deposits.

The rhythmic unit containing the Sandwich Fish Bed is here about 60m thick and the four units making up the 'Hoy Cycles' average 16m. The latter contain some relatively thick channel sandstone phases. Fish Beds ascribed to the Upper Stromness Flags are well exposed on east shore of the Brough of Birsay (a tidal island), on which the remains of a Celtic Monastery, a Viking settlement and an 11th Century Cathedral and Bishop's Palace can be seen. ENE-trending camptonite dykes form prominent features on the north shore of the Point of Buckquoy.

## **Locality 3 Whitaloo Point (HY 261 281)**

One of the best examples of a tight isoclinal fold ('ruck') within the Orkney Flagstone sequences is exposed at Whitaloo Point.

## **Locality 4 Earl's Palace (HY 247 277)**

If time permits a brief stop will be made at the remains of the Earl's Palace.

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