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# Carlops to Dolphinton

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O.S. 1:50 000 Sheet 72 Upper Clyde Valley

B.G.S. 1:50 000 Sheet 24W Biggar

This excursion looks at some of the finest glacial and geomorphological features in southern Scotland. Starting at Carlops the reader is taken in a south-westerly direction to Dolphinton, following the general direction of recession of the last ice sheet. During deglaciation some 13 000 years ago melting ice which occupied ground on the southern flanks of the Pentland Hills left behind both meltwater deposits and erosional features such as drainage channels cut into pre-existing glacial deposits or bedrock. Most of the localities are within easy walking distance of the A702 Edinburgh to Carlisle road.

## 1. Carlops: glacial drainage channels

The excursion starts at Carlops [NT 161 560], where there is limited parking at the Allan Ramsay Hotel. The village is situated within a series of spectacular drainage channels, formed during various stages of deglaciation of the last ice sheet. Ascend the track towards the North Esk Reservoir for a few metres for a fine view of an overdeepened channel through which the small Carlops Burn flows. This channel is one of several sub-parallel erosion features which follow the line of the SW–NE trending Pentland Fault system. The larger channels may have originated during the Tertiary but have clearly been greatly deepened by glacial processes involving initially englacial streams which were later let down through the ice to become subglacial rivers (Sissons, 1963). Subsequently the channels were utilised by meltwater during the last phase of deglaciation when ice occupied the West Linton area. The flanks of the channels south-west of Carlops are steep and cut in bedrock. Steep-sided rock ridges within the main channel are prominent, for example Dun Kaim, formed of rhyolitic tuff and andesite. The line of the main channel follows a fault which separates the igneous rocks of Dun Kaim to the south from sandstones of Upper Devonian age.

## 2. Windy Gowl: glacial drainage channel

For about a kilometre in a south westward direction from Dun Kaim the channel continues to follow the line of the SW-trending fault so that Upper Devonian strata form its northern flanks and andesite and Lower Devonian sandstones form the south side. Beyond this point the sedimentary rocks are cut out and the channel is cut solely in andesites. This section is accorded the evocative name of Windy Gowl probably in deference to the prevailing elements. Along the north-west side concentrations of channels cut in rock obliquely and at right angles to the line of the main channel are thought to have formed when the glacier was present in the main channel. Those who arrange to meet transport at West Linton can continue along the floor of the Windy Gowl to the road leading from Baddingsgill to the A702. There is then a walk of some 2.5 km along the eastern flank of the valley of the Lyne Water to the village.

## 3–6. West Linton: kame and kettle topography

The flat land a kilometre east of the village through which the Cairn Burn flows, was considered by Eckford (1952) to have been the site of a temporary glacial lake, meltwaters having been ponded by ice lying to the south-west. To the west an extensive spread of sand and gravel exhibits kame and kettle topography, the kettles (or hollows) having been areas of non-deposition occupied by pockets of 'dead' ice detached from the main glacier which have later melted. Considerable thicknesses of meltwater deposits are present and mounds or kames of sand and gravel exceed 35m in places. Tarfhaugh (3), near West Linton Cemetery, is a good vantage point for viewing the morphology of these deposits. At the vantage point where the West Water crosses the A702 (4) erosion by this river through sand and gravel deposits is well exhibited. Some of the larger kettles are water-filled as seen at Slipperfield Loch (5). Elsewhere the deposits have

been cut by meltwater channels which are now dry courses, as seen on the north side of the A702 road, south-west of Slipperfield Loch (6).

## **7. Medwyn Mains: eskers**

Between Medwyn Mains and Ingraston Farm the high mounds of West Linton are replaced by a series of low sinuous north-easterly trending ridges of sand and gravel which may be seen on the north side of the A702. These landforms are interpreted as small eskers which represent deposition in subglacial streams, formed perhaps prior to the West Linton kame deposits. South of Ingraston Farm the ridges disappear into a relatively flat plain, the site of another glacial lake. A borehole put down south of the A702 opposite the Ingraston road end proved at least 15m of fine sand and silt, indicative of glacio-lacustrine sedimentation (McMillan et al, 1981).

## **8. Kippet Hill: sand and gravel mound**

The remarkable conical landform known as Kippet Hill opposite the junction of the A702 and the Garvald road end, stands like a sentinel guarding the next series of high mounds or kames of glacial sand and gravel deposits. These can be traced north-westwards to Dunsyre through Eckford's (1952) Dolphinton Gap. Kippet Hill itself looks almost as if it has an anthropogenic origin but is in fact simply an isolated hill of sand and gravel. On top is a monument erected in memory of Kenneth MacKenzie of Dolphinton, killed in action in France during the 1914–18 War. Today, the Dolphinton Gap south of Garvald represents the watershed of tributaries of the Rivers Clyde and Tweed. The south-easterly flowing Garvald Burn is part of the Tweed catchment, whereas the South Medwin flows south-westwards to join the River Clyde at Carnwath. During deglaciation, perhaps when dead ice occupied the Gap between Mendick Hill and White Hill, southeasterly flowing meltwaters deposited substantial volumes of sand and gravel. A good comparison of facies variation can be made by examining sections exposed in the following two sand and gravel pits.

## **9. Nick's Plantation Pit: sand**

Access to Nick's Plantation sand pit (permission should be sought from Ingraston Farm) is gained from the Garvald Road across the line of the former Caledonian (later L.M.&S.R.) railway which ran passenger services until 1945. Here sections exhibit well bedded fine to medium grained yellow quartz sand. Cross-bedding in the sands generally dips towards the south-east and although dips may have been oversteepened by melting of bodies of dead ice adjacent to these deposits, it is clear that meltwaters were issuing in a southeasterly direction from the waning glacier. The sand contains numerous coal fragments and rare pebbles of local rock types.

## **10. Garvald Pit: sand and gravel**

Just north of Haughhead Farm, coarse-grained facies can be seen in Garvald sand and gravel pit (contact Wm. Stokes & Sons for access). Here, gravel is the major constituent. Locally NW–SE trending ridges of coarse gravel and boulders, reminiscent of cores of eskers, have been exhumed during quarrying operations indicating that these deposits formed at an earlier stage in deglaciation and were later buried by outwash deposits as the glacier receded. Small scale normal faulting, disrupted bedding and rapid vertical and lateral variation in grain size of the outwash deposits are indications that these sands and gravels were laid down adjacent to bodies of standing ice. In addition to local igneous and sedimentary clasts, the gravel contains indicator stones of felsite probably from Tinto Hill and Cairngryfe Hill, used by McCall and Goodlet (1952) to invoke a south-westerly origin (i.e. from the Southern Uplands) for ice during the build-up of the late Devensian ice sheet.

## **11. Dunsyre: sand and gravel, glacial lake**

The extensive spread of moundy sand and gravel deposits may be traced south-westwards to Dunsyre. Beyond lies the flat ground of the South South Medwyn valley which represents another glacial lake site. It appears likely that as the glacier continued to wane south-westwards, waters were ponded against the barrier of the Dolphinton kames (McMillan

et al, 1981) until drainage in a westerly direction to the Clyde was effected.

## References