Glaciation In the Yorkshire Dales

This geotrail is mainly concerned with the impact on the landscape of the last glaciation. This is quite significant not only for the immediate area but also for the rest of the Ribble valley downstream.

The glacial landforms we can see here today result mainly from the last ice sheet which covered the Yorkshire Dales from roughly 26,000 to 19,000 years ago, with a later readvance approximately 12,000 years ago. The centre of the Dales ice was at the head of Wensleydale and from there it flowed east towards the Vale of York and south down Ribblesdale and Chapel-le-Dale. Its route to the west was barred by ice moving south and south-west from the Lake District. At its peak, even the highest hills were completely buried by ice, but once this began to melt down, the hills emerged. Although still active, the ice gradually became confined to the valley bottoms.

The landscape was altered by both glacial erosion and deposition. Erosion mainly resulted in the widening and deepening of the pre-Pleistocene river valleys which exposed the older rocks in the valley bottoms around Horton and Ingleton. It tended to remove the softer rocks most, producing the stepped valley sides with their prominent limestone pavements, especially those associated with the tough Great Scar Limestone. Deposition resulted in extensive spreads of till, especially in the valley bottoms and lowlands. To these were added lateral and terminal moraines but the most distinctive and widespread features are drumlin fields, especially around Ribblehead and to the west and south of Settle.

Once the ice started to melt, increasing volumes of meltwater cut many meltwater channels and locally deposited masses of sand and gravel especially around Malham Tarn, Littledale and Grassington. Here and there, surrounded by deposits, the final blocks of ice to melt left large depressions called kettle holes. Finally, as the climate continued to warm up, the post-glacial drainage system became established, floodplains and river terraces were created and the great sheets of blanket bog developed on the high plateaux.

There is much more information about glaciation and the geology of Newton Gill on our website at http://www.geolancashire.org.uk /long-preston-geotrail.html
Walk 6 Long Preston

At the top of Green Gate Lane, you will have good views over the wall to the NW across the flood plain over which the Ribble meanders. In winter, this is likely to be flooded and gives a good impression of what it probably looked like at the end of the last glaciation. Then, this part of the Ribble valley from Settle southwards was occupied by a pro-glacial lake. The Craven ice front was retreating up the valley towards Ribblehead and Irish Sea ice was retreating NW between the Bowland Fells and Ingleborough. This led to a lake being impounded behind a moraine which extends across the valley between Long Preston and Hellifield. It may be seen beyond the south-eastern outskirts of the village as a series of low hills as shown in Fig. 1. (See also location 5)

The form of these valleys suggests that they are meltwater channels and this is supported by the sand and gravel deposit at the confluence. The upper reaches of these streams as well as others in the area such as Otterburn Beck, run parallel to the axis of the main valley. Taken together, all the channels are part of a system which carried meltwater along the margin of the ice as it retreated north-westwards.

Along Langber Lane, the route heads SE through one of the larger drumlin fields of northern England. This extends beyond Skipton, Barnoldswick and Gargrave and is made up of over 150 drumlins. Drumlins are typically low, egg-shaped hills. By plotting the long axis of each drumlin in the field, it is possible to reconstruct the direction of ice flow. Here, the flow of ice which produced these drumlins split with some ice flowing down the Aire valley and some going down the Ribble. Supporting evidence consists of scratches (striae) on the rockhead surface made by rocks embedded in the base of the moving ice sheet. Their direction, like the drumlins on either side of Langber Lane, production by ice flowing in the direction of the Aire valley.

Viewed from New Pasture Plantation, the two valleys of Long Preston and Brook Gill Becks above the foot bridges are comparatively deep and steep-sided. Also, the flat-topped area above the steepest slopes enclosed by the two streams is a deposit of sand and gravel. See Fig. 2.

Little Newton At some stage prior to the last glaciation, the River Aire flowed SE through this area along what is now the valley of the Ribble between Long Preston and Settle all the way down from Ribblehead. There is a possibility that a buried channel revealed in boreholes near Bendgate (SD838 567) may just be on the line of the former River Aire.

Waters View This extensive shallow lake is very obvious between the railway and the A65. It is one of a number of similar lakes such as Coniston Lake (SD895 555) and Tenley Plantation (SD863 556). It owes its existence to a large block of ice melting among masses of sand, gravel and till. The lake basin, known as a kettle hole, occupies the place where the ice finally melted away. It appears to have been much more extensive in the past since there are other peat deposits SW of Hellifield station at SD850 570. In time, the basin will fill up with more peat deposits.

Bearing right, cross three walls until another path is joined following a wall on your right. Cross a small stream before climbing up between walls to Langber Lane. Follow this past Bookiller Barn (Location 3) to a stile signed-posted “FP Long Preston” (see photo on Title panel). There is no clear footpath here, head in a SW direction until you see three walls coming together in the bed of Newton Gill. Cross the stream and bear over the shoulder of Ling Hill keeping above the Gill as it passes through a little gorge. This takes you over a stile in the wall, beyond which you descend to the stream bed below the gorge. As you drop down to the valley floor, look out for a little side valley on your left (E) with a prominent crag in it (Location 4).

Return to the main track, cross a footbridge, then bear right through the farm buildings (Location 5) onto New House Lane (Location 6) unless you started at Waterside Lane, in which case you will need to take the access track between walls back to the railway bridge. Follow New House Lane past the church and school back into the village.

Distance 7 km (4.3 miles). Allow 2.5 hours if just walking and another hour at least to explore the geology and landscape.

Map OS Outdoor Leisure 1:25K sheet 41 is absolutely necessary to navigate using the stone walls and where the footpath is ill-defined.

Additional Notes

Fig. 1 View across site of pro-glacial lake and low morainic hills
Meltwater flowing SE out of the ice would have carried a large volume of sediment which was dumped into and eventually in-filled the lake basin. With the establishment of the post-glacial river, sediment continued to be deposited but climatic variations led to the creation of river terraces, the deposition of alluvium and finally an extensive area of lowland peat.

Fig. 2 Meltwater features between Long Preston Beck and Brook Gill Beck
The steepest slopes enclosed by the two streams is a deposit of sand and gravel.

Fig. 3 The Waters View, kettle hole
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