THE QUATERNARY LANDSCAPE HISTORY OF TEESDALE AND THE NORTH PENNINES

Field Guide

Edited by

David J. A. Evans

Quaternary Research Association

2017
The Quaternary landscape history of Teesdale and the North Pennines

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Cover photograph: Drumlins and meltwater channels in Lunedale, above the southern margin of Teesdale (D.J.A. Evans)

Produced to accompany the QRA Field Meeting based at the Teesdale Hotel, Middleton in Teesdale, 11-14th May 2017

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Preface

The Durham Dales have never formed the centrepiece of a QRA field meeting and Teesdale in particular has never been visited by the QRA. This reflects an unfortunate neglect of the area by the Quaternary scientific community in general and goes some way to explain why little appears to be known about the glaciation of Teesdale. The mainstay of the little knowledge we do possess is provided by the substantial work of Arthur Dwerryhouse, who in 1902 published his paper “The Glaciation of Teesdale, Weardale and the Tyne Valley, and their tributary valleys” and therein provided a wealth of local descriptions on the nature of the drift and erratics of the area as well as the major glacial landforms, including drumlins and meltwater channels/glacial lake spillways. Building upon earlier observations of regional erratic distributions, this work established the concept of valley glaciers in the Durham Dales and the notion that they operated in tandem with regional ice streams. Also significant was the recognition that ice-dammed lakes figured in the glaciation history in some way; for Dwerryhouse they were full glacial phenomena, as this style of topographically constrained glaciation was compatible with the notion of nunataks in the north Pennine uplands. On this field meeting we will resurrect Dwerryhouse’s ice dammed lakes, although very much as deglacial features, and we will investigate the style of dynamic ice sheet glaciation as deciphered from the complex inter-relationships of the region’s glacial landforms.

Abundant local detail on the glacial landforms and deposits of Teesdale is found also in the British Geological Survey report on Sheet 32 (the country around Barnard Castle) compiled by Mills and Hull (1976). Therein are mapped the locations and thicknesses of morainic drift and glacifluvial landforms as well as the proposed details on the pre-glacial to deglacial evolution of the Tees and surrounding drainage networks, developing on the earlier work of Fawcett (1916) on Tertiary rivers.

Towards the modern era, Teesdale has figured in Wishart Mitchell’s (2007) evaluation of dynamic upland drumlin formation and Peter Wilson and Richard Clark’s (1995) proposal that a Younger Dryas glacier existed below Cronkley Scar, the latter resurrecting a long held assumption by Gordon Manley (1959) that Younger Dryas ice had developed in the area, specifically in Maize Beck. Most recently, the subglacially streamlined landforms of Teesdale have been assimilated by Livingstone et al. (2008, 2012) into a complex sequence of regional ice stream activity during the last glaciation.

The palaeoecology and archaeology of Teesdale is no less fascinating, as evidence for human activity as far back as the palaeolithic is in abundance and the recent finds of artefacts by Rob Young and co-workers at Cow Green make this meeting
particularly timely. The unique flora of the north Pennine uplands, particularly at Cow Green, make the area special in terms of studying vegetation development since deglaciation, although it has taken some time to act upon the early recognition in 1966 by David Bellamy and local botanist Margaret Bradshaw that local peat assemblages contain records of the Lateglacial.

This field meeting is a long overdue attempt to compile, re-assess and evaluate the extent to which we have developed upon all of the above research contributions and concepts. It is time to bring Teesdale out of the Quaternary science shadows and celebrate its rich landscape history. With respect to landforms, recent developments have been facilitated by the advent of improved aerial imagery, especially the NEXTMap data set or digital elevation model (DEM), an extract of which (Figure 1) has been used to compile new and existing mapping (Figure 2 & 3). Much of this guide will cross-reference this new compilation, using it to demonstrate the morphology and distribution of major landforms and Quaternary deposits as well as bedrock lithological controls.

David J A Evans

Durham University and resident of upper Teesdale

From Wainwright’s 1968
“Pennine Way Companion”
Figure 1: NEXTMap DEM extract of Teesdale and surrounding terrain
Figure 2: Physiography (NEXTMap) and location map of Teesdale and the northern England region. White box indicates area of glacial geomorphology mapping presented in Figure 3.
Figure 3: Glacial geomorphology of Teesdale and adjacent areas mapped on the NEXTMap imagery presented in Figure 1.
Acknowledgements

The editor would like to thank all the contributors to this field guide and the meeting in Teesdale. Thanks also to the QRA meetings officer, Clare Boston, and Publications Secretary, Jonathan Lee. Many figures in the guide were expertly produced by Chris Orton of Durham University.
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