

FIELD EXCURSION TO EXAMINE THE SEDIMENTOLOGY AND ENGINEERING GEOLOGY OF PERMIAN STRATA IN THE TORBAY AREA, 5TH JANUARY, 2015

S.E. McVICAR WRIGHT¹, R. GOULD² AND R.C. SCRIVENER³



McVicar Wright, S.E., Gould, R. and Scrivener, R.C. 2015. Field excursion to examine the sedimentology and engineering geology of Permian strata in the Torbay area, 5th January, 2015. *Geoscience in South-West England*, **13**, 491-494.

The purpose of the field excursion was to examine the sedimentology and engineering geology of Permian strata cropping out in the Torbay area. The trip included visits to four locations where a range of sedimentary features and engineering problems and solutions were evident.

¹ *Camborne School of Mines, College of Engineering, Mathematics and Physical Sciences,*

University of Exeter, Cornwall Campus, Penryn, Cornwall, TR10 9EZ, U.K.

² *Frederick Sherrell Ltd., 66 West Street, Tavistock, Devon, PL19 8AJ, U.K.*

³ *Demmitts Farm, Posbury, Crediton, EX17 3QE, U.K.*

Keywords: Permian, sedimentary strata, engineering geology, Torbay.

INTRODUCTION

The succession of rocks relevant to the field excursion is illustrated in Figure 1. At the base are the Devonian Saltern Cove Formation and Torbay Limestone Formation. The former, which has been dated as Frasnian to Upper Famennian in age, includes much mudstone and fine grained siltstone with some breccias including clasts of limestone (Leveridge *et al.*, 2003), while the latter consists of grey thinly-bedded limestone with interbeds of calcareous mudstone to pale grey thickly-bedded massive limestone that has been dated to the transition between the Eifelian and Givetian stages (Leveridge *et al.*, 2003).

Permian strata overlie unconformably the Devonian rocks and form much of the succession (Figure 1). Breccias and conglomerates of the Torbay Breccia Formation, which are Early Permian in age (Cisuralian epoch), are the oldest beds of the New Red Sandstone in the Torbay area and have been interpreted as being flash flood deposits laid down in braided river systems, although evidence of aeolian deposition is also present (Leveridge *et al.*, 2003). Clasts include rounded Devonian limestone, sandstone and slaty mudstone with subordinate vein quartz, hornfels, chert and quartz-porphyry, and are set in a matrix dominated by red-brown sand with subordinate silt and clay. Within the Torbay Breccia Formation is the 15-m thick Corbyn's Head Member which comprises medium to coarse grained cross-bedded sandstones, with some thin volcanoclastic beds. These sediments are purple- to red-brown to buff and pale green in colour and have been interpreted as deposits of fluvial or deltaic origin passing into aeolian environments (Leveridge *et al.*, 2003).

The Mid to Late Permian Watcombe Formation overlies unconformably the Torbay Breccia Formation (Figure 1) and includes coarse to fine breccias, muddy siltstones and coarse sand. The breccias have clasts of sandstone, limestone and rarely quartz-porphyry, and 'shale-paste breccias' are developed locally which comprise decayed red slaty mudstone clasts in a clay matrix (Selwood *et al.*, 1984; Leveridge *et al.*, 2003). The breccias are thought to have been laid down by debris flows but the finer sediments may be streamflow deposits or those of a braidplain. At the base of the Watcombe Formation is the

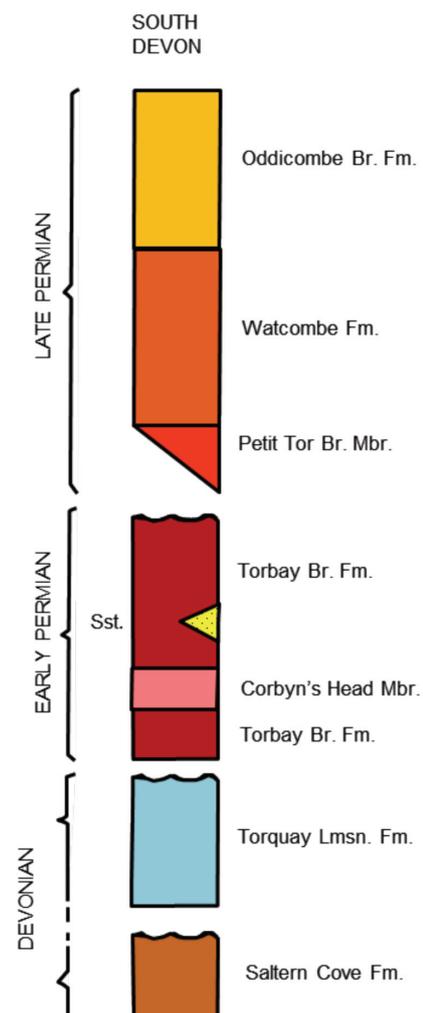


Figure 1. Stratigraphy of rocks in Torbay area.