Feature

Stately home geology: the building stones of Tyntesfield Manor

Visiting a stately home open to the public can be a geological excursion in addition to a journey into social history. This is an experience akin to Darwin speculating whether his next landfall would present him with 'igneous or metamorphic' rocks to test his early geological knowledge, even before he had received Lyell's *Principles* when the *Beagle* reached Buenos Aires. In Britain the prospects are good when the house is Victorian or Edwardian, and we are facing the rich industrialists investing his wealth in opulent interiors within a High Gothic external architecture. In the West of England, this can be tested by a visit to Tyntesfield, a mansion acquired by the National Trust to the south of Bristol in South West England in 2002. Reputed to be little changed from being a family home, it has become a place where booking a timed visit is advised, such is public interest. It also has an added interest in that the Trust is in receipt of a grant from the Heritage Lottery Fund in order to carry out repairs and refurbishment of the many ancillary buildings of the landscaped estate. The work is proceeding alongside public visits, so offering insight into building conservation.

Eric Robinson
Watchet, UK

Tyntesfield has an ideal setting on the south facing slopes of one of the periclinal folds in Carboniferous limestone that are a feature of Mendip and Avon Valley geology, as described by Vaughn and Dixon in the years before the 1914–1918 Great War (Fig. 1). The slopes below the house are in a sense a continuation from the cliffs of the Avon Gorge and the Brunel Suspension Bridge so well known to geology parties visiting Bristol. The limestone locally is deeply notched by ancient valleys cut by post-Carboniferous erosion and filled with the pebbly dolomitic conglomerate, which is widespread in the Avon Valley and Mendip slopes. To the south-west, at Nailsea, there is an isolated basin of Coal Measures (Fig. 2) of which there is little-or-no surviving trace in the landscape, let alone proving exposure.

The fabric of Tyntesfield Manor

From this range of solid geology, it is only the last two that figure to any extent in the fabric of the house. Carboniferous limestone is a brittle and splintery stone, difficult to dress in a way to match the needs of well-ordered architecture. Much the same might have been expected of the Permo-Trias dolomitic conglomerate, but it was not so. In the domestic ranges of the extensive plan, and in the Chapel, it is quite prominent, presumably for its textures and warm colour tones (Fig. 3). As for the Coal Measures, there was an earlier house which was incorporated within the later grand mansion. Traces of this can be seen from the back courtyard in an area where the smooth render which rectified any rough surface has peeled away to reveal what seemed to be dressed blocks of Pennant Sandstone which need have come no further than from Nailsea no more than 5 km from the site. To these extents, the house grew from its' immediate geology, even the Carboniferous limestone figuring in a rather modest rock garden and slope-retaining walls beyond the Chapel.

This brings us to the ambitions and investment of the Gibbs family after 1860, and what we see as the

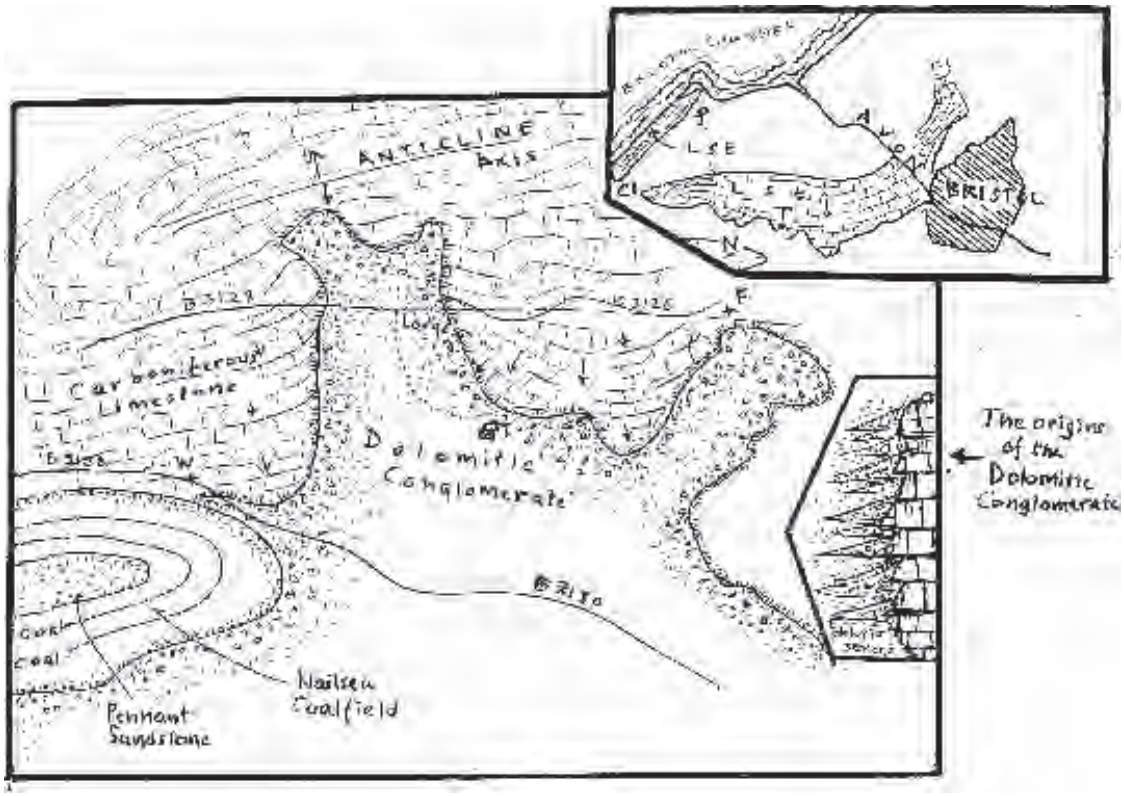

Fig. 1. Geological map showing the location of Tyntesfield (T) and relative to the outcrop of Carboniferous rocks in the south-west of England (west of Bristol). Note the facies relationships between the limestone and dolomitic conglomerates.

imposing exterior of their family home (Fig. 4). Their wealth came from several different enterprises, with strong links with trade with Spain, involving West Country cloth, and Spanish wines. Spanish connections gave access to South America, Peru in particular. This gained for the family exclusive rights to trade in guano from the offshore islands in the Pacific. In the mid-nineteenth century, long before petro-chemical fertilizers, guano was a very valuable material in commercial farming served by improved machinery and rising to the needs of the growing population of industrial Britain. The Gibbs prosperity allowed them to engage architects and craftsman of the highest standing, which they did. As architect, they called in John Norton who had Bristol and London connections (that included Pugin and Ferrey), which led to a house with the High Gothic styling that impresses the visitor on arrival to the east front: towers, turrets, high-pitched gables, tall chimneys, and a speciality of Tyntesfield, candle-snuffer finials (Fig. 4). Such decoration was

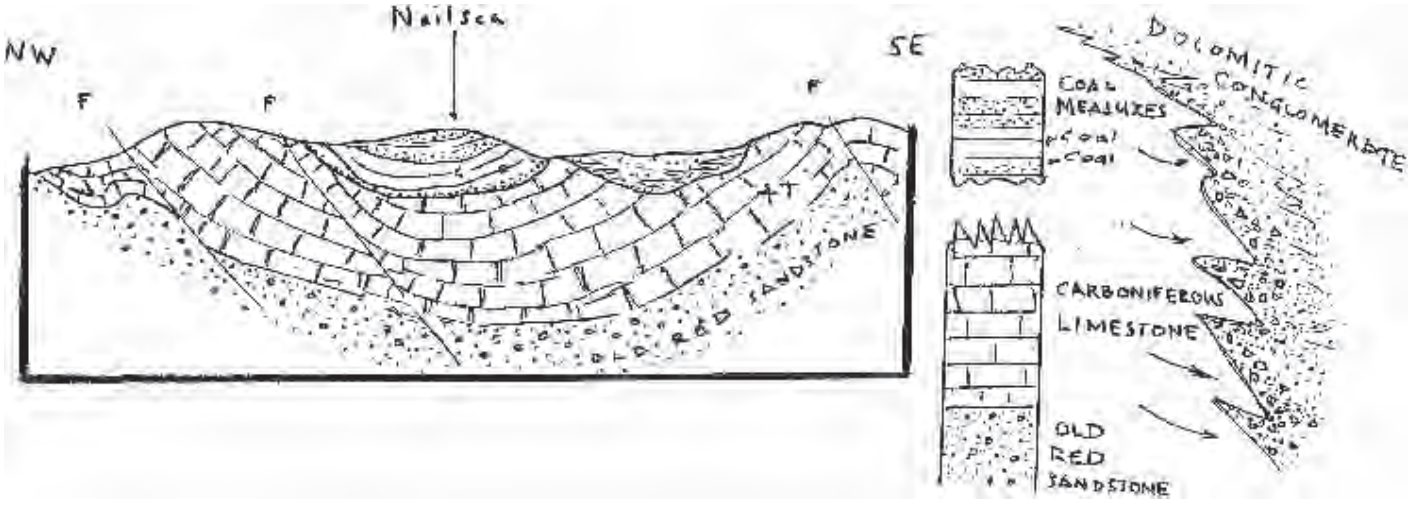

Fig. 2. Sketch cross-section of the isolated basin of Coal Measures at Nailsea, showing the relationship with the dolomitic conglomerates. Tyntesfield (T)

Fig. 3. Dolomitic conglomerate in the walls of a stone house off the courtyard. Door surround: Bath Stone.

all practicable from the fact that the chosen building stone was best quality Bath Stone oolite. Henry Gibb was a prominent sponsor of the Great Western Railway and a champion of Brunel, so we can assume that stone came via that railway to sidings around Backwell at the foot of the slope below the house site to be delivered to the workforce of William Cubitt.

The Gibbs family was High Church and of the Oxford Movement with their commitment to Pugin-style pointed architecture and rich interiors. William Gibb in particular paid for the Butterfield chapel of Keble College Oxford, and engaged Arthur Blomfield to build the tall chapel at Tyntesfield (Fig. 5) which rises to the north of the house. Built against a considerable slope, the chapel has a lofty undercroft which is one of the best exposures of dolomitic conglomerate you could find (Fig. 6). Above, the walls are of bands of orange-yellow Ham Hill Stone from the unique source of Stoke-sub-Hamdon across the Somerset Levels to the south. That orange-coloured stone is set in horizontal strips between further thicknesses of dolomitic conglomerate, giving the chapel very much the patterning of Keble and other Butterfield churches. These walls and those of the storerooms off the courtyard are of easy-access at eye level, allowing search for the distinctive Viséan fossils of one or other of the Avon Gorge succession limestones (Fig. 7). The pebbles are poorly sorted and quite angular, giving a clear impression of sheet flood and erosion by active streams draining the Clevedon Ridge. That ridge must have been gashed by erosional stream courses at flood intervals in otherwise desert-like Permo-Trias conditions. It brings to mind Burrington Combe, or even Cheddar in Mendip geology.

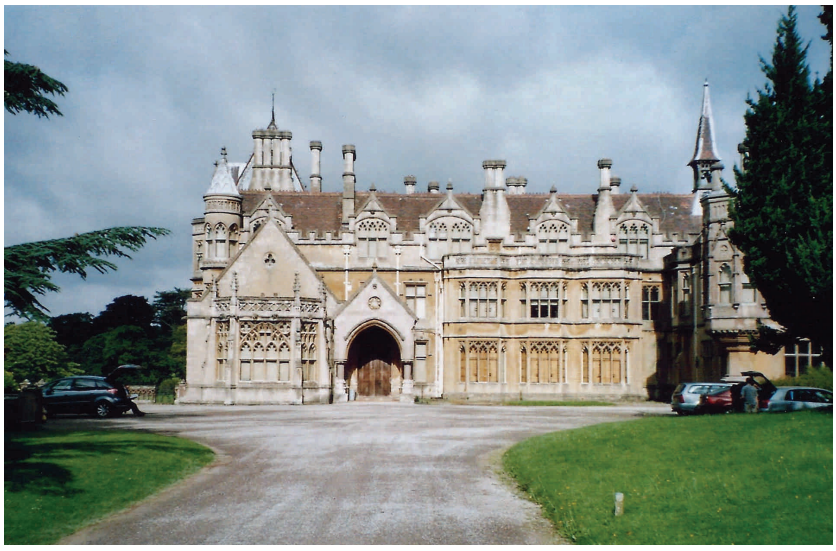

Fig. 4. East front entrance to the 1864 house, constructed by John North for the Gibb family.

A tour of the house

If we are normal visitors about to take the conducted tours of the house, in the deep set entrance porch, we can appreciate the Bath Stone ashlar and the very lively 3-dimensional carvings in the capitals supporting the canopy. We also see octagonal columns of pink Peterhead Granite, the stone so popular with Victorian architects throughout Britain (Fig. 8). The fine polish which these columns retain after nearly 150 years exposure should remind us that polishing to this degree was an industrial skill attained in the Aberdeen yards of McDonald and McDonald and Leslie in the 1830s to lead the world for many decades. As it is, the porch columns are but a prelude to what we find when we pass into the tall hall of the house. Here we find polished columns at all corners, either rounded or octagonal, but always with the same high quality finish. Asked to provide notes for the house guides, the usual dilemma arose. Granites, true marbles and limestones that had taken a high polish, in all accounts were grouped together as 'marble'. Do we press home a geological judgement which may sound like nit-picking to guides and public alike? It is a debateable point. In the circumstances, I choose to be a geologist. If people take away no more geology than this, we progress, possibly they come away with the same message to pass on their friends with a degree of satisfaction.

To architects and to the fitting trade, a marble is effectively a stone which will cut and take a polish, retain that polish and possess a 'figure' or pattern to make it attractive when polished. 'Figure' may be fossil content, or veining of a light character. Full veining and colour changes may signify that the limestone has actually been deformed, and taken to raised temperatures, actually qualify geologically to be termed 'marble'. I think that this is a distinction worthwhile making if we are to advance our science in the eyes of the public.