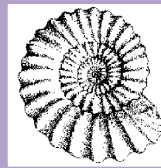




Bath Geological Society

# Brown's Folly Nature Reserve

Richard Pollock, Chairman, Bath Geological Society

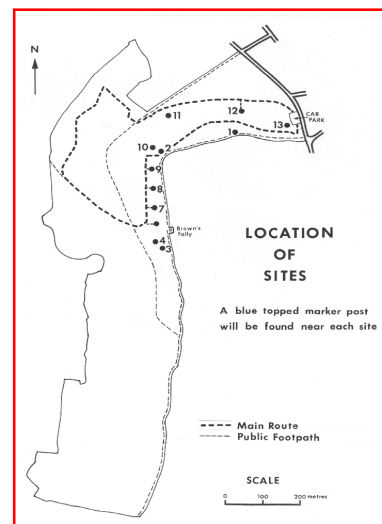
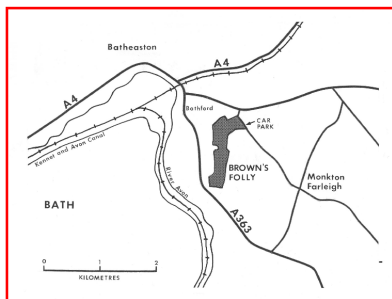


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**Brown's Folly Nature Reserve** consists of 91 acres of land on the hillside overlooking the valley of the River Avon about half a mile south-east of the village of Bathford. It is owned by the Avon Wildlife Trust and has been designated as a **site of special scientific interest (SSSI)** because of the Middle Jurassic rocks, plants, wildlife that can be found there.

Extensive limestone extraction on the reserve, largely by mining, was carried out in the past, the stone being used for building and known as **Farleigh Stone**. This activity, long discontinued, has left the rock exposed at many sites enabling it to be examined. The study of the different layers (strata) of rock and the fossils they contain has made it possible to establish when they were formed and to build up a picture of what the area would have looked like at the time. A sediment of ooids, sometimes mixed with shell material from the organisms living in the sea, would have collected on the sea floor and eventually become cemented together to form a rock. As conditions such as the depth of the sea varied, different types of sediment formed to be later consolidated into the different rocks seen today on the reserve.

The rocks seen on the reserve are from the **Chalfield Oolite Formation** and the **Forest Marble Formation**. A number of different rocks make up each group and these can be seen in the **Sequence of Rocks at Brown's Folly**. In this table, the rocks are set out in sequence, together with their total thickness and an indication of the rocks that can be seen at each site.



## Site 11 Combe Down Oolite/Twinhoe Beds

The right-hand face consists of the **Combe Down Oolite**, the oldest rock seen on the reserve. This rock is clearly different from the other oolites seen so far. It is darker in colour and contains a considerable amount of fossil debris and some small whole fossils. The rock is not suitable for working as a freestone here, but south of Bath at Come Down and Odd Down its nature changes and it has been and still is worked for building purposes. It is less porous than the Bath Oolite and therefore withstands the weather better. At the bottom of the face is a small platform of hard massive rock with, above it, a rock that is clearly layered and which has fallen away resulting in the face being undercut. If the layered rock is examined carefully at a clean edge, the layering can be seen easily. Small fossils are common on the faces of these layers and at some levels burrows are also present. On the left hand corner of the face cross bedding structures have weathered out. Above this are the **Twinhoe Beds**, the name being taken from the village of Twinhoe near which they could once be well seen in an old quarry. These beds consist of a wide variety of rock types from hard shelly limestones to soft clayey bands.



## Site 8 Upper Rags

The lower rock face to the right of the rough path up the cliff shows the junction between the **white oolite** and the **honeycomb weathered beds** above and shows similar rocks to those seen at Site 5. To the left of the rough path is a rock face with, at the base, **white oolite**, and above, a **deeply weathered rubbly rock**. Examine the rock face (DO NOT HAMMER) and fallen blocks carefully to see if you can find anything that may give you a clue as to the environment in which it was formed. The rock is clearly unlike any seen at the other sites visited and its nature is best shown when a piece is cut and polished or examined as a thin section of rock under a microscope, but a diligent search in the scree could produce a block showing the features illustrated.



## Site 10 Bath Oolite/Upper Rags

You will no doubt recognise the rocks as the Bath Oolite overlain by the Roof Bed and white oolite, (here very shattered). The special interest at this site is the mine and the way the rocks have moved. The mine only penetrates a short way into the hill; the reason for this seems to have been that a fissure, seen at the left hand side of the back wall of the mine, made the stone of poor quality or unworkable. Although the mine is little more than an entrance, it does give some idea of what a mine was like and shows inside the greatest continuous thickness (4.5m) of Bath Oolite seen so far. Stand back from the face and, using the Roof Bed as a marker band (assuming this was originally horizontal) see if you can deduce how the rocks have moved (tilted).



## Site 5 Bath Oolite/Upper Rags/Forest Marble

The main rock face shows rocks that you have seen before. At the base was the Bath Oolite but now it is the bricked-up entrance to an old mine. It is overlain by the Roof Bed which is here thicker than that seen at Site 1. Above the Roof Bed is a white oolite looking much like the Bath Oolite below it and indicates a return to the same sort of environment that existed before the Roof Bed was deposited. If the oolite above the roof bed is examined carefully, and this can be done at a small rock face to the left of the main face, it will be found to be more shelly than the Bath Oolite and also have the remains of small vertical burrows in it. The burrows show that there were some organisms living in the oolite (probably bivalves) indicating that there were periods of stability during the deposition of the oolite that enabled organisms to become established. This oolite was not mined on the reserve but was mined to the east near Bradford-on-Avon where it is less shelly. It was worked as a building stone and known as Bradford Ground stone or Bethel stone.



## Site 4 Upper Rags/Forest Marble

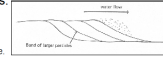
At the top are beds of the **Forest Marble** showing very clearly the cross bedded nature of this formation with a prominent band of brown clay at its base. The rest of the face shows a series of rocks forming part of the **Upper Rags** a name derived from the quarryman's description of these rocks; 'Ragstones', so called because of their variable nature and general unsuitability as building stone. At the base is a **white oolite**; this is not the Bath Oolite but the oolite seen above the Roof Bed at Site 1 and will be examined in more detail at Sites 5 and 7. The clay band at the base of the Forest Marble is a thin representative of the **Bradford Clay** that forms much thicker deposits around Bradford-on-Avon and from which exceptionally well preserved fossils have been obtained. The most famous of these is a crinoid *Apiocrinus*.



## Site 2 Forest Marble

These rocks are some of the youngest seen on the reserve (but still about 170 million years old) and form part of the rock formation known as the Forest Marble although they are strictly not marble at all; a true marble being a limestone whose structure has been altered by being exposed to high temperature and/or pressure. The name Forest Marble was first used for a limestone of this formation that was quarried for ornamental stone in Wychwood Forest in Oxfordshire. The rocks seen at this site are hard, brown and contain bands of shells and other fossils, some whole but often fragmented, and are sometimes oolitic. The rock splits fairly easily along the shell bands and has been used for building work such as field walls and farm buildings. Thin clay bands between limestone bands are common; one can be seen in the corner near the junction of the two faces.

The sediment deposit moves downstream like a wave as sediment is deposited on the sloping face. Periodically, larger particles that have collected at the top of the slope avalanche down forming distinct bands marking the slope.



If you would like more information about the geology of the reserve or would like to assist with site conservation work, please contact the Bath Geological Society

Fig. 1 BGS Poster for Geoconservation for Science and Society conference