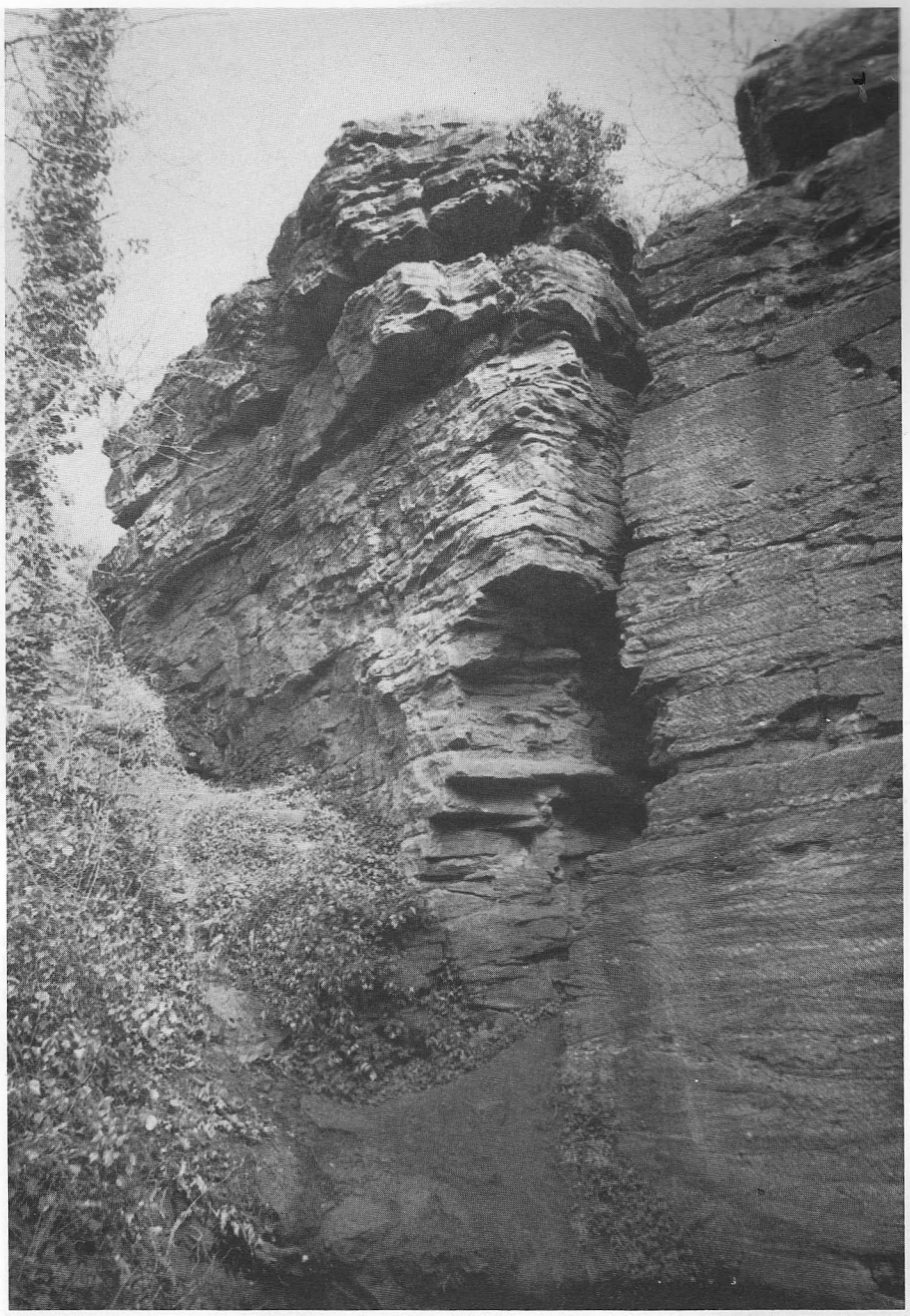
The geology of Ham Hill.

Article · July 1996

1 author:

Simon Haslett
Bath Spa University
147 PUBLICATIONS **1,397** CITATIONS



An old quarry face at Ham Hill exposing Ham Hill Stone; examples of cross-bedding can be seen in the bottom right of the photograph.

The Geology *of* HAM HILL

by
SIMON HASLETT
Photographs by the author

Simon Haslett is Lecturer in Geography at Bath College of Higher Education.

Ham Hill rises above Stoke-sub-Hamdon in south Somerset. It has long been famous for the unusual stone which characterises the area, known as the Ham Hill Stone. As well as being of value because of its aesthetic and building properties, Ham Hill Stone is also of great geological interest.

Ham Hill is often described as a well-defined plateau. This description arises from the steep climb up the side of the hill, and because of the relatively flat expanse of the 84 hectare hill-top. The summit of the hill is capped by a relatively resistant rock-type - the Ham Hill Stone. The underlying rocks, known as the Yeovil Sands, are softer and are more easily eroded. Therefore, once the overlying Ham Hill Stone has been removed, erosion of the Yeovil Sands proceeds rapidly, resulting in the steep sided hills we see at Ham Hill.

Both the Ham Hill Stone and the Yeovil Sands are sedimentary rocks that were deposited during the Jurassic geological period, which began some 200 million years ago. More precisely, they are both considered to be Lower Jurassic in age, and have been attributed to the geological formation known as the Upper Lias. The Lias derived its name from its well-layered appearance, although this layering isn't so apparent in the Upper Lias as it is in the Lower and Middle Lias, where alternating layers of limestones and shale characterise the rocks. The Yeovil Sands occur below the Ham Hill Stone, and so are slightly older.

The Yeovil Sands occur over a wide area in south Somerset, from Sherborne in the east through Yeovil to Crewkerne in the southwest, and are comprised of layers of fine-grained sand, crumbly sandstone, and sandy limestones, and is about 40m thick at Ham Hill. Fossils are not common in the Yeovil Sands, particularly in the lower sections, but fossils such as ammonites can be found in the higher parts.The Ham Hill Stone on the other hand is a shelly limestone which is almost completely made up of fossils; unfortunately, nearly all the fossils have been badly broken, and it is only when the rock has been sliced and viewed through a microscope that the fragments of shell can be seen clearly. However, some whole identifiable fossil specimens of ammonites and brachiopods (a type of seashell) can be found on rare ocassions. The Ham Hill Stone is about 25m thick on Ham Hill, but it is also found on other hills nearby, where it tends to be much thinner, such as at Gawlers Hill, Chiselborough Hill and Chinnock Hill to the south. Apart from these occurrences, the Ham Hill Stone is found no where else, and in that respect is very

rare.

Despite the lack of fossils in the Yeovil Sands, there is abundant evidence that the sand has been thoroughly churned up by the burrowing of soft bodied animals which never became fossils themselves. Normally only animals with a hard shell are likely to become preserved as fossils, as soft body parts decay away shortly after death. This burrowing is likely to have been performed by worm-like creatures either living on or within the sediment, rather like in modern day sand flat environments, where lugworms churn up the sand. Thus, the Yeovil Sands has been interpreted as being deposited in a sandy shore environment.

Interestingly, there is an equivalent sand layer to the Yeovil Sands in north Somerset known as the Midford Sands, which occurs around Bath. This sand layer extends southward to Yeovil where it becomes the Yeovil Sands, and continues southward to the Dorset coast, where it is known as the Bridport Sands. From the fossils contained in the Sands at each locality, it has been possible to establish the age of each of them. Generally, the Midford Sands in the north are the oldest, whilst the Bridport Sands in the south are the youngest, with the Yeovil Sands being intermediate in age. This younging in the Sands from north to south suggests that the sandy shore was migrating southward during the period in which deposition was taking place, acting rather like a modern day offshore sand-bar.

As this sand-bar migrated southward, the amount of sand available decreased, because it was being deposited during migration, and by the time the sand-bar reached the Dorset coast the sand supply was nearly exhausted. Channels formed through the sand-bar, excavated by powerful tidal currents, linking the open sea to the south with the water body behind the sand-bar to the north. One such channel, and a major channel at that, broke through the sand-bar in a line northeast of Crewkerne. Abundant shell material accumulated in this channel, deposited by the tidal currents moving through the channel in a north easterly direction. This flow direction is established by looking at bedding in the rock faces, where sediment accumulated on the sloping lee side of sea-bed ripples, producing what is known as cross-bedding. Thus, in this ancient coastline, the flood tide was undoubtedly much stronger than the ebb tide. These accumulations hardened to become the shelly limestones we now call Ham Hill Stone.

The area was inundated by the sea following the breakdown of the sand-bar, and a shallow marine limestone was deposited at the start of the Middle Jurassic, known as the Inferior Oolite, which can be seen outcropping from Sherborne, through Yeovil and Crewkerne, to the Dorset coast. Although not found on Ham Hill itself, patches of Inferior Oolite can be found above the Ham Hill Stone at West and Middle Chinnock, and on Chiselborough Hill. It comprises small egg-shaped sediment grains or ooids, which formed in a warm tropical sea where gentle currents rolled around the ooids, successively coating them in limescale. Fossils are usually abundant and well-preserved in the Inferior Oolite, in particular ammonites are exquisitively preserved and highly sought after.

Spoil heaps seen on Ham Hill; the product of two thousand years of quarrying Ham Hill Stone

The uniqueness and aesthetic value of the Ham Hill Stone has long been acknowledged, and the stone has been quarried at least since Roman times. However, the hill top has been occupied for considerably longer than that. Evidence of Neolithic (new stone age) people on Ham Hill is abundant, with many flint scrapers, axes and arrowheads being found over the years, in addition to pottery fragments and some stones that originally came from Cornwall. Bronze age artifacts have also been found, which suggest that the hill may have been occupied and defended well before the onset of the Iron age, when it became occupied by people of the Durotrigian tribe. The Durotrigians were opposed to Roman occupation, but a systematic programme of pacification by the Romans in Durotrigian territory led to the development of a major Romano-British settlement on Ham Hill, complete with a Roman villa. There is little evidence to suggest what replaced the Romans on Ham Hill following their departure, but it is certain that the Saxon invaders continued to quarry the stone.

Ham Hill is a key site for unravelling the complex geological history and geographical setting of Somerset during the Jurassic period. The Ham Hill Stone, restricted to Ham Hill and a few hills nearby, is also of value as a building stone. The resistance of Ham Hill Stone to erosion influenced the development of the steep-sided plateau that is now Ham Hill, producing an ideal site for early Neolithic people to dwell, and for later populations to exploit, in terms of quarrying. Today one is free to explore Ham Hill to the full, investigating the rock faces in the disused quarries, and walking amongst the spoil heaps produced by two thousand years of quarrying. ●

A shelly limestone as seen through a microscope.