Geological Foundations

So much of what surrounds us is the creation of the very distant past. Our hills and valleys, our streams and soil, our gardens, our building stone, the ways in which Hook Norton people have made their living in the past, are all the result of events that took place over many millennia an almost inconceivably long time ago.

About 300 million years ago, the future site of Hook Norton lay near the equator, as part of Earth's great supercontinent now known as Pangaea. This central landmass began to break up about 175 million years ago and Hook Norton

An ammonite fossil picked up recently behind Ironstone Hollow.

These creatures lived in the seas between 240 and 65 million years ago, when they became extinct along with the dinosaurs.

Photo: Donald Ratcliffe

began its long continental drift towards the north. In the process it found itself at times under water in an area where small seas and lakes were depositing sediments we now define as Lower Jurassic. By the end of the subsequent Cretaceous period, about 65 million years ago, sea levels had fallen and Oxfordshire became dry land.

As a result of this sedimentation, the lower-lying parts of the parish are floored by a series of "Middle Lias" limestone layers approximately 165 million years old.

These rocks were laid down more or less horizontally, the Middle Lias limestone being covered by “Upper Lias” clay; above this stratum lies “Middle Oolitic” limestone, including patches of chalk, up to the level of the higher land surrounding the village. Hook Norton stands just at the southernmost tip of the Redlands, a band of country spreading down from the northeast through Northamptonshire in which the Middle Lias limestone was richly stained with iron compounds in veins running up to ten metres thick. In colour these veins of iron are blueish grey but oxidisation of the surrounding deposits has turned the rock a reddish (literally, “rusty”) brown, thus creating the archetypal building material of Hook Norton.

The former railway cutting - now a wildlife gem for ferns, flowers, butterflies and birds.

Photo by Jim Asher, from www.bbowt.org.uk/reserves/Hook-Norton-Cutting

These sediments are rich in fossilised remains and many examples may be seen in the ironstone walls of the older houses in the village. The various Jurassic levels and many fossils may be seen in the old railway cuttings north and south of the railway tunnel; the cuttings are now nature reserves administered by the Berks, Bucks and Oxon Wildlife Trust. The most formidable fossil, however, is a ferocious-looking dinosaur unearthed in the north-western part of the parish and now housed (but not on view) at the Natural History Museum in Oxford. However, the current displays in the museum show some interesting fossils from Hook Norton, including one piece of our dinosaur’s vertebrae, classified as *lexovisaurus*, an early sub-species of stegosaurus.

About 30 million years ago earth movements started to form the Alps and subsequent movements created folding and faulting in southern England. The strata in Oxfordshire tilted gently – less than one degree – toward the south-east, leaving bands of rocks running from south-west to north-east. Two trough faults were formed in north Oxfordshire, leaving valleys where water found its way to become the **two** streams, the Stour and the Swere, which mark the present parish's northern and southern boundaries. In particular, the Stour has its source in the spring near Highways Farm, by Tadmarton golf course, and its upper waters created the steep valley we cross at the low point (Temple Mill) on the road to Sibford and at Traitor's Ford, where it crosses into Warwickshire on its way to join the Avon.

Similarly, erosion of numerous cracks and gullies formed the middle valley where the old village stands. The shape of this valley was set in the latter stages of the last ice age, about 15,000 years ago: at its maximum the ice over the South Midlands was probably hundreds of feet thick. As the ice retreated, the parish entered a periglacial stage, something like present-day Siberia, with permafrost allowing only the top few feet of soil to thaw in the summers. The ice sheets had retracted to their present levels about 10,000 years ago, though further retraction has also occurred in the last two hundred years.

Some of the fast flowing rivers created as temperatures rose were quite wide, especially in the lower reaches, and can today be identified by some flat meadows where now only small streams run. In time the water levels fell leaving deposits of silt where grass, scrub, gorse, trees and shrubs flourished. The parish also contains areas of heavy clay and stonebrash (a sub-soil made up of fine stones and finely broken rock) which are not good for farming, but, in general, the ironstone soil has proved rich and fertile, sustaining a mixed agriculture that enabled the parish to avoid the overdependence on sheep typical of much of the Cotswolds.

The nature reserve on Cow Lane south of the railway line remains as a fine example of chalk downland as it was before modern agriculture. The hillside has abundant oxeye daisies, orchids and other wild flowers and can, on sunny July afternoons, resemble a butterfly farm, of Marbled White, Meadow Brown, Ringlet and

Marbled White Butterfly.

Photo from www.bbowt.org.uk/reserves/Hook-Norton-Cutting

Painted Lady. The adjoining lanes are typical of the alkaline soil, the white blooms of blackthorn (sloe) in early spring preceding strong scented hawthorn. Crab apple and flowering cherry thrive, and in late summer wild clematis ("old man's beard") swarms over and up the hedgerows and trees. The village gardens reflect the nature of the soil, cowslips, primroses and fritillary in spring, lilac and clematis in early summer, and later great arching sprays of purple buddleia fluttering with August butterflies. Only the most workaholic gardener considers trying to plant acid-seeking rhododendron, camelia or heather.

The ironstone has also contributed to Hook Norton's industrial experience. The percentage of iron is so small that probably no iron was worked here locally for thousands of years; any iron implements found probably came through traders from outside, as was the case with earlier copper and flint. But after 1540 ironstone replaced wood as the main local building material until 1887: by then processes had developed for extracting the ore, the coming of the railway made it possible to transport it to the furnaces of Wales and the Midlands, and so for sixty years Hook Norton became an industrial centre. In that period brick was used more for building, then reconstituted stone, and only in the last thirty years has ironstone once more become the building (or facing) material of choice.

The local ironstone is soft, easy to shape and carve, but weathers poorly. Carvings on masonry and tombstones disappear on exposed surfaces. Older buildings were often built with intervening, even alternating, courses of harder oolitic limestone for greater strength; the oolitic limestone was said to help a wall hold up while a hole was inserted for a window or door. The ironstone cannot be split thin for roof tiles, and so for centuries thatch roofs were usual; only wealthy households could afford beautiful roofs of graduated Stonesfield stone slate, as seen, for example, at Magdalen Lodge. Not until the railway came in 1887 did slate from Wales become standard. Nowadays the local supplier of ironstone has premises on

An example of alternating courses of ironstone and oolitic limestone in Queen Street.
Photo: Donald Ratcliffe

the site of the former Brymbo ironworks and hews stone quarried at Great Tew. It is a typical “Hornton” ironstone, dark brown by day, which after absorbing sunlight by day, glows red in the dusk.

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This article is based on notes made by Percy Hackling, now in the Village Museum and Archive, on the displays in the Oxford University Museum of Natural History, and on the Berks, Bucks and Oxon Wildlife Trust’s www.bbowt.org.uk/reserves/Hook-Norton-Cutting.