

### Is Conservation Destroying Geology?

After the good parts of a year spent in the Peak District, gathering information and photographs for a new book on the landscape and geology, it has become depressingly clear that the geological values of our nearby National Park are slowly being lost beneath a shroud of greenery. Having visited the area frequently since the 1960s, various changes have become all too apparent. Much of the geological loss is due to current enthusiasms for reducing human impact on the natural world. Furthermore, it appears that bio-conservation is all-powerful, even at the expense of geological values.

These notes are not the result of a comprehensive study, but combine to form a personal lament. They relate cases that seem to characterize an overall situation that must cause concern among geologists, and perhaps should encourage some re-thinking by the managers and conservationists who are largely focussed on botanical aspects of our countryside.

#### Lathkill Dale

Among all the beautiful dry valleys within the White Peak's fluviokarst, the upper part of Lathkill Dale (upstream of Lathkill Head Cave) is one of the finest and most distinctive, with its lines of crags along the horizontal bedded limestones (Fig. 1). But what was once an attractive open valley is fast being invaded by hawthorn trees. These self-seed all too easily in the limestone soils, and rapidly grow into large trees with dense foliage. The prospect of a valley eventually masked by, and choked with, impenetrable greenery is fearsome, but is beginning to look inevitable.

The march of the hawthorns is largely due to the lack of sheep grazing. The dale is entirely within its

own section of the Derbyshire Dales National Nature Reserve, from which sheep are excluded. This may be to the benefit of the dense woodlands that fill the dale further downstream, but only diminishes the geological values of the karst terrain in this upper section.

One wonders what nature the reserve is intended to protect. Unfortunately, the totally natural landscape of the White Peak is one entirely covered by shrubs and trees. From about 5000 years ago, these were progressively cleared in order to create open land for farming, and sheep have since played a vital role in maintaining the open grassland pastures that offer the delightful vistas across the limestone terrain. Such land is described as sheepwalk. This continues to exist because the sheep nibble the tops off all the growing plants, thereby decapitating and destroying the growth areas of young plants and trees, whereas the grasses thrive because their growth zones are at their roots. Remove the sheep, and trees will establish unhindered.

The unwelcome end-result can best be seen further north on the limestone benches of Ingleborough (Fig. 2). There, the many areas of limestone pavement and open fell are well known and much treasured, thanks in part to sheep grazing. In contrast, Colt Park Wood is a tiny slice of the same limestone benches on which sheep grazing has long been excluded; it is now a forest of ash, moss and numerous other plants that shroud the limestone pavement and hide the geology. Colt Park is a wonderful piece of preserved terrain, but replicating it across the whole of Ingleborough would be a disaster.

Flora and fauna within the reserves receive statutory protection that outweighs interest and value of geodiversity conservation. However (to quote from the notice boards on the Lathkill reserve), "it is an offence to destroy or damage any of the geological or



Figure 1. Encroaching hawthorn trees in Lathkill Dale, seen in 1970 (left) and in 2020 (right).



**Figure 2.** Limestone pavement that has been grazed by sheep on Ingleborough, in the Yorkshire Dales (left), and Colt Park Wood with the same geology and no history of sheep grazing (right).

physiographical features by reason of which the land is of special interest” on pain of prosecution and a fine up to £20,000. One wonders how long it will be before the hawthorns mask the physiography to such an extent that Natural England becomes liable to its own fine.

Meanwhile the purist bio-conservationist can approve the spread of the hawthorn trees in Lathkill Dale, while ignoring the loss of all other features. A return to the wooded landscape that pre-dates the Neolithic farmers is just not wanted, whereas the managed grasslands of the last thousand years are very much worth conserving. Grazing sheep could do a lot for the geology of this lovely stretch of the dale. Or, if left to nature, Lathkill Dale will be lost from sight.

### Cressbrook Dale

Within a separate section of the Derbyshire Dales NNR, Cressbrook Dale is another classic dry valley, with most of its length between grass slopes and few rock scars, as is typical of the Peak District fluviokarst. A special feature of this dale has been the old mineral workings just south of its Tansley Dale tributary. But these are already practically lost to a combination of inevitable weathering and another invasion of hawthorn trees (Fig. 3).

A pair of parallel mineral veins had been worked long ago for the galena that they could yield. Two lines of shallow open-cuts trace the veins up the flank of the dale, and continue as strips of gruffy ground (consisting of pits and spoil heaps along with capped or uncapped shafts), across the fields above. However, the gruffy ground in the upper field has degraded and grassed over, and the mined cuts down the slope have also suffered from weathering. The latter have sprouted the hawthorns in places that could probably only have been culled by goats instead of any sheep. So this site would be more difficult to manage, but it has now declined to the point that passing walkers would not notice this piece of the Peak District’s mining heritage. One more bit of geology subsumed by unwelcome greenery.

### Hob’s House

The isolated crag of limestone known as Hob’s House is a fine example of an old landslide within the White Peak limestones. Long ago, it was easily seen from Monsal Head, from the viaduct along the Monsal Trail and from the footpath beside the River Wye. But it is slowly being hidden behind a barrier of trees (Fig. 4). What was once a fine geological site is on its way to becoming a featureless canopy of trees, and just one more loss to the National Park.



**Figure 3.** Old mineral workings in the flank of Cressbrook Dale, as they were in 1970 (left) and as they are now (right).



**Figure 4.** The Hob's House landslide and the Monsal Trail viaduct, seen from Monsal Head in 1970 (left) and in 2020 (right). The growth of the hawthorns on the slope on the right gives some indication of the future situation with larger trees that are already growing on and in front of the limestone blocks that constitute the landslide.

### Monsal Trail

Midway between Miller's Dale and Monsal Head, the Litton Mill Railway Cutting was excavated in 1863 by the Midland Railway, and now forms a rock scar alongside the Monsal Trail that has been established since the railway's closure. The special feature of this cutting is that it provides a longitudinal section cut through the terminus of the Lower Miller's Dale Lava, which is one of the various basaltic lavas now lying within the limestone succession.

At Litton Mill, the front end of the lava flow is seen as a tumbled mass of rounded boulders within a matrix of hyaloclastite that is now somewhat altered and weathered from its origins as shards of volcanic glass. The boulders are interpreted as pillows that rolled down an underwater slope where the lava was being chilled to produce the glass fragments, in a situation very similar to that which can be seen today where lavas flow into the sea along the south coast of Hawaii.

In 2009, a short section of the rock face of the cutting was cleared of invasive plants, cleaned up, and beautifully presented as a geological landmark with an explanatory sign-board in front (Fig. 5). By last summer, 2020, it had received little or no maintenance, and consequently this fascinating geological exposure was, and still is, slowly disappearing beneath a blanket of greenery.

Enquiries with the Peak Park geologists revealed that clearance of the rock face was opposed by the Park's ecologist on the grounds of biodiversity. Apparently some of the plants, grasses, mosses and/or weeds that were encroaching on the rock face were considered to be essential components of the ecology and should not be removed. After appropriate protest, the ecological argument ameliorated in view of the greater geological value of the site.



**Figure 5.** The Litton Mill Railway Cutting at the side of the Monsal Trail, exposing a profile through the front of the lava flow, as it was when first cleared on 2009 (left) and before its explanatory signboard was in place, and as it appeared in 2020 (right).



**Figure 6.** The daylight stope on Long Rake, near Youlgreave, when it could be seen during the 1970s, before it was capped and rendered inaccessible and invisible.

An offer for the clearance work to be done by a volunteer group from the Society was politely declined, when we were told that a proper clean-up of the site, hopefully with removal of all the invasive greenery, was within the National Park's 2020-21 winter work programme. But that programme then suffered from 'staff shortages' during the covid chaos, and the work was not done. It has been re-scheduled for the winter of 2021-22, and we look forward to having a good clean rock exposure again.

### Long Rake

Workings on the mineral veins in the White Peak limestone commonly included long and deep vertical stopes. Few of these were open to daylight, but there was one well-known example on the Long Rake, north of Youlgreave, which was actually very accessible even though on an unofficial basis (Fig. 6). Sadly this is no longer to be seen, as it was capped by concrete beams some years ago. It was a lost opportunity, because similar concrete beams could have been used to construct a viewing platform at one end of the open stope, and so become a real asset in terms of the area's heritage of geology and mining.

Unfortunately, there were complex issues regarding this particular site, and these killed off hopes for the viewing platform, before the protective cap marked the demise of a rather spectacular feature. This one could not be blamed on the biologists, but it can be regarded as something of a failure within the wider scheme of conservation and planning. Furthermore, one cannot help but wonder if the same would have happened if the stope had been seen to contain a bat roost and had thereby gained the excessive protection that is normally bestowed on such sites.

### Mam Tor

The active landslide on the face of Mam Tor that overlooks the head of the Hope Valley at Castleton is a classic slope failure. Despite being a rotational slide in its upper part and a debris flow in its lower part, it had a major road built across it in times of old when landslide movements were not fully understood (Fig. 7). Every few year the road suffered repeated damage



**Figure 7.** The upper road onto the Mam Tor landslide, the day after it was broken in 1977 by movement of the small rotational slide within the main slide mass.



**Figure 8.** The abandoned road across the Mam Tor landslide, as it appeared during 2020, with slices continuing to fall away where it is underlain by the complex slide structure.

when landslide movements were significant during wet winters, and it was finally closed in 1979. Since then, the abandoned road has become steadily more broken, stepped and twisted with on-going landslide movements (Fig. 8).

When the road was finally abandoned, it reverted to ownership by the National Trust, who already owned the land encompassing the entire landslide. Plans soon emerged for a grand scheme of landscaping that would remove the perceived eye-sore of the defunct road and restore the hillside to a natural state. In the face of protests from geologists and academics, such a plan was soon dropped, but it is horrifying that anyone in a role of planning and site management could ever have seen that as a sensible way forward. Safely untouched, the Mam Tor landslide now constitutes a magnificent teaching site, where so many processes of ground deformation are clearly demonstrated by the changing state of the road. It has also become a popular and spectacular extra for the many visitors to its sector of the National Park. This one eventually came to be a success in terms of geo-conservation.

### **Middle Peak Quarry**

There are so many sites, not just in the Peak District but all around the world, where the view from a viewing platform is obstructed by trees and shrubs that have been allowed to grow within the line of sight. Middle Peak Quarry, above Wirksworth, may not be widely known, but is a large quarry in limestone, recently abandoned and then deemed worthy of a viewing platform on its rim that now lies within a local park. Stone steps and a timber platform are all very welcome, but then a tree has grown directly in front to partly obscure any view of the quarry (Fig. 9).

The situation is not unique. At various sites, the excuses for the lack of action include Health and Safety (with respect to whoever might cut the tree down), budget constraints (with the costs of ten minutes with a chain-saw insignificant against the cost of building the platform), and of course bio-conservation (because



*Figure 9. The view of Middle Peak Quarry at Wirksworth from the specially built viewing platform, with the tree that now cannot be avoided.*

it's a tree). One can only hope that the offending tree at Middle Peak Quarry is soon removed, without a concerned geologist having to take action during a moonlit night.

### **A future for geo-conservation?**

Not all is doom and gloom. There are many excellent examples of geo-conservation, in the Peak District and elsewhere. But at too many locations it appears that geo takes a second place to bio, and in these heady days of carbon awareness, new and more and larger trees are so much the in thing. Yet matters can perhaps go too far, when a current trend is at the expense of all else. It is starting to look like trees could be spreading out of hand in the Peak District (and perhaps equally elsewhere, but that is outside the theme of this essay).

Old postcards of the Wye Valley east of Buxton show the road that is now the A6 with clear views up to the limestone crags of Topley Pike. Today not a glimpse of the hill is gained from the road, because mature trees hide every view away from the tarmac. This might be appropriate for a road, where driver distractions should not be a design feature, but walls of dense foliage are surely not appropriate where vistas are hidden from walkers. The footpath along the lower half of Lathkill Dale is now through a tunnel of greenery, and the path round the site of the infamous Dale Dyke dam failure now offers a purely botanical experience, to cite just two examples where geology can no longer be enjoyed.

There is of course an important place for conserved woodland, as indeed for the other bio-environments. But any geologist looking round the Peak District will be frustrated at how much the geological values are being lost beneath or behind encroaching greenery. Furthermore, some of this, or even much of this, appears to be the result of conservation policy. Environmental science has always focussed on the bio-sciences, both botanical or zoological, while the geo-sciences have been pushed aside. To some extent this is perhaps warranted, because the living environment is more fragile than rock, but this can go too far; there does appear to be an in-built bias at Natural England and within the National Parks. Perhaps also because such environmental roles are a natural career path for bio-scientists, the staff at Natural England includes far more bio-scientists than geo-scientists, and the shortage of geologists working for the Peak District National Park is even more extreme.

Regardless of staff ratios, the policies and actions of conservationists should not ignore the geological values of sites within their charge. But the current picture of encroaching trees and deteriorating geo-sites does suggest that geology is being side-lined within the Peak District. And that is rather sad. Surely our geological heritage is worth a little more consideration.

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