

a the conservation value of *bandoned pits and Quarries* *in* **CORNWALL**

edited by: Adrian Spalding
Stephen Hartgroves
John Macadam
David Owens

for the Derelict Land Advisory Group
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CHAPTER *Six*:

ABANDONED PITS AND QUARRIES: A RESOURCE FOR RESEARCH, EDUCATION, LEISURE AND TOURISM

John Macadam (Earthwords) and Robin Shail (Camborne School of Mines, University of Exeter)

1. Introduction

Pits and quarries are regarded by many as environmentally unacceptable 'blots on the landscape', to be filled in as soon as possible when they are abandoned. They are an increasingly valuable commodity as waste receptacles, and have been used as such for centuries. Even when not formally designated and engineered as waste sites, they are still seen by many people as convenient places to dump their domestic, agricultural and trade refuse. The aim of this short paper is to identify some alternative uses of abandoned pits and quarries so that communities, and individuals, can see the potential and often unrecognised value of this resource.

Examples of diverse uses are provided from Cornwall, the rest of the United Kingdom and the European Union. Many of these pits and quarries are being valued by different sections of the community, for a range of activities, so strengthening the case against infilling. It is regrettable that geological features do not at present explicitly come within the Countryside Stewardship scheme, thus landowners have no financial incentive for preservation and often regard old pits and quarries as private landfill sites. (But it is sometimes possible for Stewardship schemes to include such works as scrub clearance on access routes, if the project officer is sympathetic).

2. Abandoned pits and quarries for research

Quarries often provide exposures of

geological importance that cannot be seen elsewhere. Cornwall has excellent outcrops along its coast but the geology is generally poorly exposed inland where abandoned quarries may also provide important ecological habitats that support a diverse flora and fauna. As a consequence many pits and quarries, both active and abandoned, have a statutory designation as a Site of Special Scientific Interest (SSSI), and are thus protected by the Countryside and Rights of Way Act, 2000.

An early selection of important sites in the West Country by the Nature Conservancy Council's then Chief Geologist was published in 1970 (Macfayden, 1970): six out of the fifteen sites in Cornwall were pits or quarries, and at least three more included pits or quarries. Between 1970 and 1990 the Geological Conservation Review (GCR) process was a rigorous re-evaluation of the scientific importance of all the SSSIs designated for geology and geomorphology (Ellis et al., 1996). Since the early 1990s the Joint Nature Conservation Committee has been publishing individual GCR volumes. The Igneous Rocks of South-West England volume (Floyd et al., 1993) includes fourteen abandoned pits and quarries, plus five active ones.

Site of Special Scientific Interest is a statutory designation but many other sites have a non-statutory designation, also on scientific grounds, as Regionally Important Geological/geomorphological Sites (RIGS). Other grounds for RIGS designation are educational, historic (e.g. a site where an important scientific principle was first

demonstrated) and cultural or aesthetic (possibly because the site was an important source of building stone or is a well-known landmark) (Nature Conservancy Council, 1990). Some pits and quarries have a non-statutory designation for their wildlife importance: in Cornwall these are designated as 'County Wildlife Sites', in other counties the designation is different. Likewise in some counties RIGS are also known as 'County Geological Sites' (e.g. in Devon), and in places all geological and wildlife sites come under one umbrella, possibly as a SINC, a Site of Importance for Nature Conservation. Non-statutory sites have a measure of protection under the planning process.

Designation is an on-going process, but advances in science are rather faster so the scientific importance of any natural or man-made rock exposure, designated or not, will vary over time

Research does not just take place at designated sites so it was instructive to scan a couple of major international research journals for papers about the geology of the south-west and, in particular, Cornwall. Two topics of current research interest are the geology of The Lizard and the origins of the granites and the mineralisation, and both draw research workers from abroad. The Lizard was the subject of a paper by a Canadian-British research team in the *Journal of the Geological Society* in 1998 (Clark et al., 1998): the locality sampled was the edge of a quarry at Porthkerris, within an SSSI. Research on granites and mineralisation was published in 1993 (Chen et al., 1993) again by a Canadian-British

team in the *Journal of the Geological Society*: localities sampled were a mix of designated and undesignated sites. Work by an American-German-British team was published the same year (Chesley et al., 1993) in *Geochimica et Cosmochimica Acta*: again the localities used were a mix of designated sites and undesignated sites, including quarries.

Some sites are the focus of repeated research as new techniques and understanding are developed. An example is St. Erth Pits (Millett, 1886; Mitchell et al., 1973; Jenkins, 1982; Roe et al., 1999) and the subject of a case study in this volume (Macadam, 2002a).

Some sites are reference localities for geology. Of particular note are sites important for stratigraphy, illustrating a tiny portion of the immensity of geological time. An example here is the 'abandoned' quarry at Thouars, in France, with the historical type section for the Toarcian Stage of the Jurassic. The quarry face is not of immediate interest to the layman - indeed it is a rather monotonous, layered, brownish rock - but innovative interpretation involving placing casts of the significant ammonite fossils at the relevant levels (Plate 26), as well as an information panel (Figure 1) alongside has turned a research site into an educational site as well. This excellent example of promoting PUS (Public Understanding of Science - or 'Vulgarisation ...' in French) has, hopefully, sown the seed that many other 'old quarries' could be of scientific importance. The site is protected as part of the French national suite of Réserves Naturelles.



Figure. 1: Information panel in the quarry at Thouars. (c. Kevin Page)

A major importance of pits, quarries and other man-made exposures of rock (such as mines and road cuttings) is that they give geologists rock to study where the only other option would be a borehole, with its very restricted size and often prohibitive cost. Cornwall does of course have a wealth of disused mines and the unflooded sections above adit level provide a so-far under-used resource: it is important to design access into shaft caps when safety work on mine sites is planned (Cornwall Underground Access Advisory Group, 2001).

3. Abandoned pits and quarries for education

Pits and quarries can be used for many subjects in the National Curriculum: science, geography and physical education are three obvious ones. Geology is not a separate subject, but elements appear in both science and geography: most of the geology is taught within the 'Materials and their properties' strand of the science curriculum. A few schools offer GCSE Geology, as a separate subject and in 1999 there were about 1,600 candidates (in England, Wales and Northern Ireland), compared with 257,000 for Geography. At Advanced Level the contrast is not quite so

great: 2,000 candidates compared to 42,000 for Geography. Undergraduate and post-graduate courses have a need for field sites too (Figure 2) and Cornwall is an important location for Advanced Level and undergraduate residential field classes in geology and geography. Continuing education courses also need sites to visit.



Figure. 2: CSM student in quarry at Cligga Point, Perranporth. (c. John Macadam)

Attempts have been made to establish criteria for assessing the educational potential of sites (Wilson, 1994 p. 219; Reynolds et al., 1997). Both Dorset (Thomas, 1996, 1998) and Devon (Page & Chamberlain, 1999) have registers of educational sites for school use, with the suitability of sites for different age groups assessed. Devon's register is available both on the county's intranet and on the world-wide web.

Certainly all attempts to develop abandoned pits and quarries for school use should be made in consultation with teachers, and it may well be that the local cemetery, with a diversity of stone, will be the best teaching tool. Where old pits and quarries can be of wider value than just for their rock there is more chance they will be used: useful features would be interesting wildlife, evidence of ancient working - especially for

locally used stone giving a tie-in to local history, and use for physical education, but the limit will be the ingenuity and enthusiasm of the teachers. An outline of how a proposal to infill a disused quarry could be the basis for work across the (Welsh) curriculum was developed by Macadam (Curriculum Council for Wales, 1993) and is illustrated in figure 3.

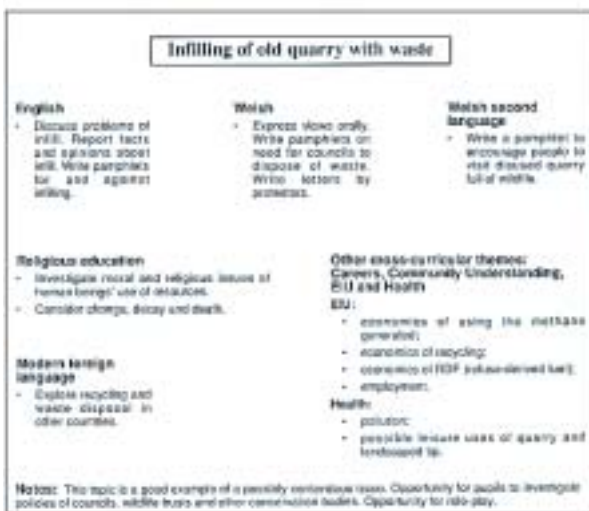


Figure. 3: Cross-curricular (environmental education) work plan for a quarry in Wales.

Locally in Cornwall, Cornwall Outdoors is developing Hendra Pit, a disused clay pit owned by IMERYS, for education. Initially the use has been of the flooded part for sailing, kayaking and canoeing, but there are plans to develop other aspects - history, art and science. One of the developing Cornwall Heathland Project sites is close by so providing a semi-natural laboratory for longitudinal ecological studies.

An interesting example of a quarry being used for combined geology and ecology was the use by the Open University's Discovering Science (S103) summer school of Northmoor Hill Woods reserve (Plate 27) in Buckinghamshire. The area included a chalk pit (also used by youthful motorbike

scramblers) as well as sandy and clayey soils. Consequently there was a wide range of habitats, even if the accidentally simultaneous use of the quarry by OU students and scramblers was not ideal (though accident-free): at least this illustrates the potential conflicts inherent in multiple use of an abandoned pit. In this case the scramblers had negotiated use of the quarry prior to its designation as a reserve.

The two 'abandoned' quarry sites in the UK with the greatest educational use are the Wren's Nest in Dudley (West Midlands) and the National Stone Centre near Matlock in Derbyshire. As well as their educational value (Cutler et al., 1990) the Silurian limestones of the Wren's Nest are also of international historical and scientific importance, and the site was declared the first National Nature Reserve solely for geology in 1956. The National Stone Centre (Thomas & Prentice, 1994) occupies a 50 acre site and comprises several limestone quarries and purpose-designed buildings (Plate 28). The Centre is an educational charity, supported by over 80 public, industrial and academic organisations. Derelict Land Grants funded much of the



Figure. 4: School party at the National Stone Centre. (c. NSC)

original set-up costs. The Centre attracts around 400 groups plus thousands of individuals each year, and informs them not only about the geological heritage but the present day importance of the extractive industries. As well as attracting school groups (Figure 4) the Centre also markets itself as a geotourism provider: “the Centre is a place for both serious learning and fun” (NSC promotional leaflet).



Figure. 5: *Tresayes Quarry, a Cornwall Wildlife Trust reserve, leased from Goonvean Ltd.
(c. John Macadam)*

Overgrown pits and quarries need a certain amount of clearance work before educational parties can use them, and this is usually seen as a conflict between geological conservation and wildlife conservation. But clearing an overgrown quarry face and adjacent area will also provide a glade for butterflies and so may increase the biodiversity of the site. Work by the Cornwall Wildlife Trust at Tresayes Quarry (Figure 5), leased to the Trust (for one peppercorn a year) by Goonvean in 2001, is intended to preserve most of the

natural colonisation of this quarry as well as clean a few rock faces to expose the spectacular geology, a very coarse-grained granite (a 'pegmatite') with feldspar crystals up to 80 cm long.

4. Abandoned pits and quarries for leisure

Many pits and quarries have been used for leisure. Quarries in granite, such as Cligga (Plate 29), Kit Hill and Cheesewring (Eddy, 2002, this volume) are popular with climbers (e.g. Peters, 1988). The flooded clay pit at Hendra has already been mentioned for its school use but community use for watersports is also developing. Many flooded gravel pits in the Home Counties now have their own sailing or waterski-ing club. Northmoor Hill Woods chalk pit provides a safe venue for young scramblers, and the noise is contained. The same point could be made about clay pigeon shooting, which was a former use of Helsbury Quarry in north Cornwall.

Many flooded pits and quarries have been stocked with fish. Carn Grey granite quarry, a geological SSSI and the main source of building stone for St. Austell, provides a place for fishing, picnicking and dog walking just beyond the edge of the town. IMERYS lease the quarry to Restormel Borough Council, which intends to designate the site as a Local Nature Reserve (LNR), under Section 21 of the National Parks and Access to the Countryside Act, 1949, and utilise available grants for management and interpretation. Currently there are over 600 LNRs in England, but few have been designated for their geological interest. One exception is

Cowraik Quarry, a source of the red sandstone used for many of Penrith's Victorian houses. The quarry was designated by Eden District Council which has also published a trail leaflet (Eden District Council, n.d.). Several wildlife trusts (e.g. Brecknock, Lancashire, Manchester and Merseyside, Shropshire, Staffordshire, Sussex, Ulster, Yorkshire, and Cornwall) manage geological reserves with varying importance for research, education and leisure. As ideas on interpretation for the public have evolved only rarely has a second generation of interpretation been produced: one such example is Staffordshire Wildlife Trust's Brown End Quarry (Cossey et al., 1995; Macadam, 2001a).

Some pits and quarries have more unusual roles. Carn Marth granite quarry near Redruth is used as a theatre, and in summer 2000 Hendra Pit found yet another use as the spectacular setting for Kneehigh Theatre's site-specific community production of *Hell's Mouth*, by Nick Darke. *Líthica*, a charity conserving abandoned quarries on the island of Menorca, holds jazz concerts and other events in some of their quarries.

5. Abandoned pits and quarries for tourism

Tourism where the interest is geology has, not surprisingly, been termed 'geotourism'. This is a small niche market. The market leader in the British Isles is the 'Landscapes from Stone' project based in Belfast and Dublin. As a result of market research the project team do not use the term 'geotourism', referring instead to 'landscape

tourism', and of course adding a large quantity of culture to their popular products (e.g. McKeever, 1999).

Whatever tourists interested in geology and landscape are called there is a growing market in providing popular trails and guides for them, and this niche is being developed in Cornwall (Goode, 1995a; Goode, 1995b; Macadam, 1995; Goode et al., 1996; Macadam, 1997; Macadam, 1998; Goode, 1998; Goode, 1999; Marks, 2000; Bates & Scolding, 2000; Macadam, 2001b, Macadam, 2001c). Many of these products feature abandoned quarries. Some quarry trails are written from a holistic viewpoint (e.g. David, 1991 and David, 2002, this volume).

The more specialist end of the market, basically amateur geologists and geologists and geology students on holiday, is catered for principally by the guides produced by the Geologists' Association. Only two of these are based solely on quarries, that for the Salthill Quarry Geology Trail (Bowden et al, 1997) and Ercall Quarries in Shropshire (Toghill & Beale, 1994). The latter has sold just under one thousand copies in seven years, far fewer than the guides to the Isle of Wight, the Costa Blanca, Majorca or Tenerife, which may reflect the fact that geologists can take their partners to enjoy a holiday in these places whereas the joys of the Ercall Quarries are probably not obvious to all. Back in Cornwall the GA Guide to West Cornwall (Hall, 1974, 1994) includes several abandoned quarries.

In addition to the Geologists' Association, many publishers both in the UK (e.g.

Unwin) and abroad (e.g. Mountain Press in the USA), have published series of geological and landscape guides. In nearly all these abandoned quarries figure prominently. For south west England, Perkins wrote two volumes in the "Geology Explained ..." series published by David & Charles in the 1970s (e.g. Perkins, 1971; Perkins, 1972). Local government (notably Cornwall County Council but also e.g. South Somerset: Prudden, 1995), small presses, local geological societies and RIGS Groups (e.g. Cumbria RIGS: Skipsey, 1994) have published many more, often restricted to their local quarry or quarries. Some, such as the Ketton Geology Trail (Dawn, n.d.), have been part-funded by industry, in this case Castle Cement.

The potential market for geotourism - or landscape tourism - is likely to expand when an area gains a European or global designation. Several of the quarries in the south west will be mentioned in moves to gain European Geopark status, a new designation (under UNESCO auspices) of areas where exceptional geology is linked with sustainable development policies. Both Cornwall (Macadam, 2002b) and Torbay are potential candidates. Thus selected 'holes in the ground' will have an economic value as a resource for developing green tourism based on an internationally, rather than just a nationally, designated area.

6. Afterword

Finally, infilling of the void left by quarrying does not necessarily preclude some of uses mentioned above. In some quarries important faces have been preserved, for research or education or

both. With some, interpretation has been provided as part of the package. A particularly noteworthy example is Craighleith Quarry in Edinburgh, the source of much of the building stone for the New Town. After infilling, the site was used for a retail development. Alongside their superstore Sainsbury's preserved (and floodlit!) part of a face, and also commissioned an artist, Reinhard Behrens, to engrave leaves on some of the facing stones of their new building. Around the walls of the coffee shop are prints of the quarry in its heyday, and for the opening a high quality leaflet was produced. Dr Chris Page from the Royal Botanical Gardens in Edinburgh was consulted and Dawn Redwoods (*Metasequoia glyptostroboides*), the nearest living relative to the fossil trees found in the quarry, were planted in front of the shop. More people now know about the quarry and its importance - and Carboniferous Edinburgh - than would have been the case with most other potential end-uses.

7. Summary

Abandoned quarries provide a rich range of opportunities for after-use. Cornwall already provides some imaginative schemes, and elsewhere there are many others. It is even possible in some cases to use quarries as landfill sites and then have long-term community after-use: a case of having your cake and eating it.

This paper also provides a range of uses that can be considered during the ROMP (Review of Mineral Planning Permissions) process under the Environment Act 1995, and, indeed, before planning applications

are made for new quarries or extensions to quarries. It is no longer acceptable for quarries to be just 'abandoned'.

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The contributors are:

Colin Bristow
Jeremy Clitherow
Charlie David
Martin Eddy
Peter Herring
Nicholas Johnson
Peter Keene
John Macadam
Jon Mitchell
David Owens
Trevor Renals
Ralph Seymour
Robin Shail
Adam Sharpe
Adrian Spalding

Abandoned pits and quarries represent a major asset in terms of their historic, geological and biodiversity value and for their potential as small-scale sources of local building stones. With an estimated total of 3-4000 small pits and quarries in Cornwall, they also make a significant contribution to local distinctiveness as features in the wild Cornish landscape of cliffs and moorland, and add a hard edge to the more gentle farmed landscape.

This report encourages all those involved in quarries (whether because of ownership, scientific and research interest, or recreational value) to engage in a creative and flexible way with the management of the resource so that the abandoned quarries have a sustainable future.

This report is based on the papers presented at the conference on abandoned pits and quarries held at County Hall, Truro on 22nd March 1999, sponsored by the University of Exeter and Cornwall County Council. Subjects include: geology and building stone, wildlife, history, planning issues and waste management.

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