MERCIAN Geologist

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Address for Correspondence
The Secretary, E.M.G.S.
Rose Cottage, Chapel Lane,
Epperstone, Nottingham NG14 6AE
0115 966 3854 alan.filmer@which.net

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Cover photograph: The eastern face of Bardon Hill Quarry, Charnwood Forest, exposing two Triassic palaeovalleys that were cut into a hillside of Precambrian rocks and filled by red beds of the Mercia Mudstone Group [photo: John Carney, with kind permission of Aggregate Industries UK].

Contents

MERCIAN NEWS

Melton Mowbray Earthquake

At 4.25 pm on Sunday, 28th October, 2001, the East Midlands was affected by a sizeable earthquake. It has been termed the 'Melton Mowbray Earthquake', although its epicentre was actually located farther north, just west of Eastwell (SK770283). The UK Seismic Monitoring and Information Service, based at the British Geological Survey offices in Edinburgh, determined its local magnitude to be 4.1 ML, a figure revised from the value of 3.8 that had been calculated immediately after the event. According to the European Macroseismic Scale (EMS), its intensity of just over 5 denotes a strong earthquake… '*felt indoors by many people, outdoors by a few, with a strong vibration causing windows, doors and dishes to rattle, hanging objects to swing, doors to open and close and top heavy objects to fall over*'. Such effects were widely experienced in an area between Mansfield, Northampton and Kings Lynn and some minor structural damage was also reported, involving fallen chimneys and cracked walls.

Contrary to media reports, this was not the 'worst earthquake in 250 years' in these parts. That honour goes to the Derby Earthquake of 11th February, 1957, with an intensity of 6-7 EMS (magnitude 5.3 ML) and an aftershock of 5 EMS (magnitude 4.2 ML). A chart of main shocks experienced throughout the UK landmass would nevertheless place the Melton Earthquake currently at number 20. It was therefore an important event, although to keep it and the Derby Earthquake in perspective, it should be noted that the ten largest earthquakes in the world since 1900 had magnitudes of 8.5-9.5.

What caused the earthquake is a difficult question to answer. Seismologists at BGS Edinburgh calculate that one solution may be that the shock was generated at a depth of 11.6 km beneath the epicentre by a dextral, oblique slip type of movement (ie extensional combined with dextral strike-slip motion). This motion occurred along a northwards-dipping fault, the orientation of which was east-west. Such a depth would place the earthquake focus within early Palaeozoic basement rocks lying below a major rift structure known as the Widmerpool Gulf. The latter is a deep, sediment-filled graben of Carboniferous age that is concealed by Triassic and Jurassic beds in this part of the Midlands. We know that the Widmerpool graben was controlled by very large faults, of broadly east-west orientation, extending deep into the basement. We also know that the modern tectonic regime of Britain is controlled by factors that include pressures exerted by the south-easterly 'drift' of the Eurasian Plate, away from the Mid-Atlantic Ridge. Putting these lines of evidence together, it seems possible that the orientation of the Widmerpool graben faults, or of similar easterly structures in the basement, would enable them to absorb modern intraplate strains by allowing portions of the crust to slide laterally past each other. It could be this process, operating at depth and involving no surface rupture, that periodically generates earthquakes of the type we experienced last year.

Bingham Trails Heritage Association

As part of the Society's charitable objectives of encouraging education, research and conservation in geology in the East Midlands we have provided funding of £250 and intellectual support to the Bingham THA. Support by EMGS and other local and regional bodies enabled the BTHA to obtain lottery money administered by the Local Heritage Initiative Fund. Phase one has seen the publication of five free leaflets (including one on geology), a display in the Old Court House and Bingham Library of a 1:10,000 geological map and other exhibits, and creation of a website (www.binghamheritage.org.uk). The geological leaflet, written by Andy Howard, is very impressive; it should bring a greater geological awareness to the residents of Bingham, and also provide useful publicity for the Society in an area where there is little surface geology to be seen.

Nottingham's medieval caves

It is unusual for a journal to include review of a paper in any other journal, but it is appropriate in this case because of the Society's interest and involvement with Nottingham's sandstone caves. The paper of note is *Nottingham's underground maltings and other medieval caves: architecture and dating* by Alan MacCormick, on pages 73-99 of volume 105 of the Transactions of the Thoroton Society of Nottinghamshire, dated 2001. This is a significant paper on all the older caves (pre-dating 1950) known under Nottingham. These include the 28 cave maltings that are Nottingham's speciality, unmatched elsewhere. It also covers the 27 other dated medieval caves, with illustrations and discussion on the carved pillars and ornamental detail that distinguish them from the larger numbers of later and more functional caves. Appendices include listings of all the cave sites, and also a valuable series of contemporary records of the older caves. Alan's very welcome paper may not be an easy read (though there are more than 40 drawings and photos), but it is a fascinating and authoritative account that adds greatly to the documentation of old Nottingham.

The Society logo

Unusually for a society or organisation, the EMGS has thrived since its formation in 1964 without a logo. But the Society's imminent guidebook on the geology of the East Midlands has required a logo to go on the cover alongside that of our co-publishers, the Geologists' Association. Accordingly, members were asked for ideas, which were then considered by Council. Hammers were rejected on conservation grounds, mammoths are used elsewhere and the choice appeared to be which fossil was most identified with the East Midlands. Charnia was the front runner, but a draft appeared to be too botanical, the palaeontologists lost to the sedimentologists and the Hemlock Stone was chosen. Various modern forms of lettering were tried but eventually a traditional form of letters encircling the stone were chosen in a similar arrangement as used by the Geologists' Association.

Looking back in the Mercian Geologist, the secretary was surprised to find only a single reference to the Hemlock Stone - in Volume 1 part 1, of 1964, in a report by Dr Frank Taylor (still an active member of the Society) of an excursion he led to localities in the area west of Nottingham. The Stone gets just six lines in the report. Happily, Frank Taylor's views expressed in 1964 are still supported by geologists currently working in the area (see page 154 of this issue).

Editorial

This issue of Mercian Geologist is rather slimmer than the first two issues of the volume merely because those two were very large; we are now down to smaller issues to bring roughly the right number of pages within the volume of four issues. Compensation appears by way of the supplement on the geology of the Matlock mines, which is a joint publication with the Peak District Mines Historical Society. The EMGS secretary has also launched a new initiative with his item on page 177 of this issue on some geological sites in France; Society members are invited to contribute to this series on "Holiday Geology", especially with accessible sites and sights in Europe.

THE RECORD

The Society has welcomed 18 new members, and membership stands at nearly 400 at the end of 2001. Special tributes were paid to three members who had recently died. Ben Bentley was unable to complete his term on Council due to illness; his enthusiasm and energy, particularly in staffing the Society display at numerous events and enthusing geology to all who passed by, will be greatly missed. Edna Colthorpe and Josie Travis were founder members from 1964; both worked hard in the early days of the Society to ensure its smooth operation and to lay the foundations of its success today, and both were regular attenders at Society lectures until this year.

Field meetings

The programme was disrupted by access problems due to the outbreak of foot and mouth disease, but four excursions were possible.

In July 2001, Peter Gutteridge led a trip to the area around the National Stone Centre in Derbyshire, and Keith Ambrose led an evening visit to the Millstone Grit of South Derbyshire.

In September, Andy Howard led a weekend excursion to Staithes and Cayton Bay, and Neil Aitkenhead led a trip by coach to Fountains Abbey and Brimham Rocks.

Indoor meetings

In March 2001, after the AGM, Dr A.R. Helmsley lectured on hay fever in the Palaeozoic.

In April, Prof. J.D. Hudson talked on the geological history and the history of the geology of the Hebridian island of Eigg.

In October, Dr Sarah Davies talked on forests, floods and fires in the Carboniferous with insights from the sediments of Nova Scotia, Canada.

In November, Dr D.T. Aldiss presented his lecture on the geology of the Falkland Islands.

In December, Dr R.L. Leake talked about new perspectives on gold in Britain and Ireland.

In January 2002, the lecture was by Dr Alf Whitaker on the deep geology of Britain.

In February, Prof. Peter Doyle entertained us with his lecture on belemnites, the mystery thunder bolt, revealing new findings that featured in the national media the following week.

Events

The Society was represented at the Geologists' Association Reunion in Liverpool and at the Creswell Crags Archaeology and Geology Road Show. Unfortunately some regular events were cancelled due to the foot and mouth outbreak.

Alan Filmer, Secretary

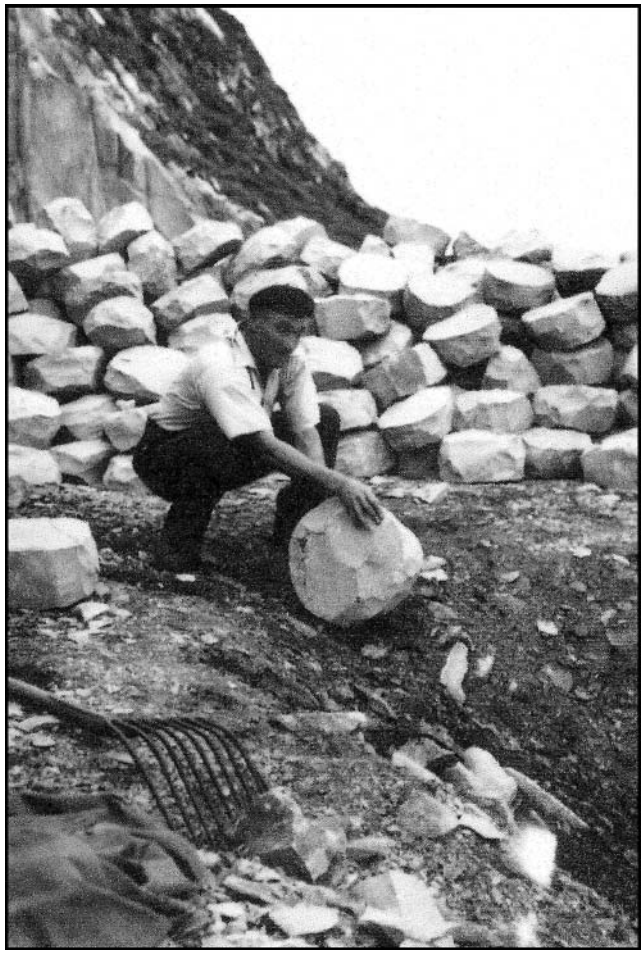
GEOBROWSER

Geology goes for gold

The victory of the UK women's curling team at this year's Winter Olympics not only gripped the nation, but also gave a measure of quiet satisfaction to those whose only recollection of geology undergraduate teaching was being told that curling stones come from Ailsa Craig. To find out if this is still the case, we made enquiries north of the Border and have been assured that the finest quality stones are of microgranite obtained solely from that island in the Firth of Clyde.

This alkaline rock is extremely hard and resistant to erosion, which is why it forms upstanding features such as Ailsa Craig, as well as Rockall Island in the Atlantic. At Ailsa Craig it contains a distinctive riebeckitic arfvedsonite variety of amphibole, and it represents a small pluton intruded during the early Tertiary magmatism (at 62-52 Ma) of western Scotland. Although it is true that the bodies of some curling stones are now made of granite quarried from Wales, their most important part, that in contact with the ice, must be made of Ailsa Craig microgranite, and in the trade this is called an 'Ailsinsert'.

With the sport now extending worldwide (Brazil and Israel were the latest to catch the craze), specifications are being tightened and a run on the existing stone resource is expected. The main curling stone quarries are on the northeast side of the island where the rarer, red (as opposed to blue) variety is particularly prized. They ceased working in 1973, but thousands of tons of the rock remain as a stockpile. As shown in the picture, roughly hewn stones are prepared on the island for shipment to workshops on the mainland.



Blocked-out curling stone 'biscuit' being rolled to the foreshore for transport by boat (photograph from BGS Report Vol. 16, No.9, 1987).

Big in Patagonia

New research is suggesting that the 'Walking with Dinosaurs' series may have been made a little too hastily. Apparently there were much larger creatures that could have been illustrated, and as reviewed in the *New Scientist* (September 2000, p.23) these have been known about for at least 15 years. Their existence has not been widely publicized because to date all the finds come from the former southerly continent of Gondwana, whereas the dinosaur hunters' favourite stamping grounds have been in sequences originally from the more northerly, Laurasian continent, in localities such as the Isle of Wight. Many Gondwanan dinosaurs fall into a new category, the 'titanosaurs', and include such species as *Gigantosaurus*, a carnivore from the Cretaceous of Patagonia, which at 14 m long and 8 tonnes was bigger than the largest *T. Rex* yet found, although apparently only half as intelligent. Even this creature may have given a wide berth to *Argentinosaurus*, 45 m long and weighing 100 t, the largest animal ever to walk the Earth. These more primitive dinosaurs apparently survived for 50 million years into the Cretaceous of South America, as well as in other parts of Gondwana such as India and Africa. What is intriguing is that close Laurasian relatives are now being found in Europe, including the Isle of Wight. So it may be that the dinosaurs of North America and Eurasia, although better known, were actually the unusual ones, generated in isolation, and it is the southern hemisphere species that represented the evolutionary mainstream during the Cretaceous.

Resurrected fossils and an old bug

While new fossils are constantly being found, it seems that other finds are more in the nature of rediscoveries that have prompted palaeontologists to re-examine many of the 'established' extinction events. A good example is the early Cretaceous (Cenomanian-Turonian) extinction among the echinoderms. Instead of the 71% of species previously supposed to have perished, examination of much younger strata, well above this time

boundary, now suggests that only some 17% did not make it (*Science 2001*, p.1037). Basing the magnitude of the extinction on groups of shallow-water taxa may have been the reason for the previous error, because after the seas retreated these creatures were not widely preserved. They only returned to the fossil record some 20 million years later, after global sea levels were re-established and shallow-water environments became better represented in the rock sequence. Other extinctions are now being looked at, to see if there has been a similar bias towards the sampling of species from certain environments only. Perhaps the most spectacular example of a 'lazarus' organism is the 250 million year old microbe discovered in New Mexico. As reported in a *Times* article (19 October 2001), but not yet confirmed, this early Triassic bacterium was found as spores sealed in a salt crystal, which was retrieved from 600 m below the ground by drilling. It was revived from suspended animation by using a growth promoter of amino acids, and belongs to one family of microbes that presently thrive in the salt-rich environments of the Dead Sea.

Delphi is not just archaeology

The testimony of certain ancient authors has linked the Delphic oracle of Greece to specific geological phenomena that have included toxic gaseous emissions, a spring, and a fissure in the bedrock. Many archaeologists and geologists have previously ridiculed these theories, geologists believing that such gases could only have been derived from volcanic activity, for which there is no evidence around Delphi (nor the Gulf of Corinth in general). Support for the ancient ideas is now at hand, however, due to recent work (*Geology*, 2001; p.707) showing that the Temple of Apollo, in which the oracle or 'Pythia' resided, is situated directly over an extensional fault. That structure controlled the locations of several springs, two of which rose within the Temple itself. Waters analysed from the one remaining spring have included traces of ethylene, most probably incorporated by passage through the highly bituminous strata beneath Delphi.

As the article explains, and we hesitate to make this generally known, the inhalation of ethylene can induce a sensation of 'floating or disembodied euphoria, with a reduced sense of inhibition and …. a frantic thrashing of the limbs'. It was the high priest Plutarch, quoted in a further recent article (*Geology*, 2000; p.651), who provided the explanation for the oracle's eventual demise. He noted that things were never the same since the destruction wrought at Delphi by the famous earthquake of 373 BC in the Corinthian Gulf. The oracles did struggle on, but by AD 381 the 'euphoric' powers of these ladies had declined to such an extent that the attraction was closed, so ending a tradition that had been in existence since at least 1400 BC.

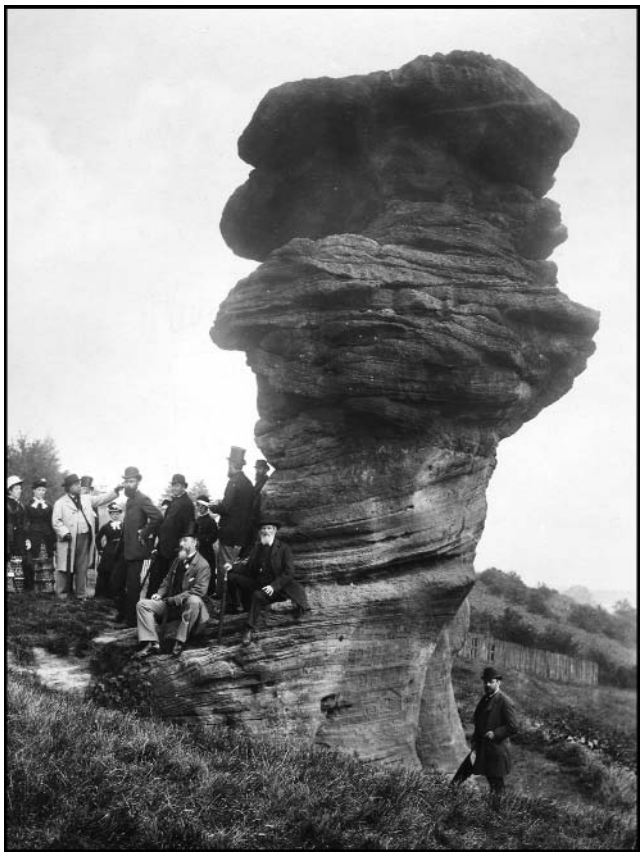
FROM THE ARCHIVES

An archive photograph of East Midlands geology from the British Geological Survey collection.

The Hemlock Stone

One of the East Midlands' most well-known geological landmarks, the Hemlock Stone is of course very familiar to *Mercian Geologist* readers, having adorned the cover of each individual part of Volumes 13 and 14. The Hemlock Stone now sits proudly in the centre of the Society's new logo, so it seems fitting to choose the Stone as the subject of this issue's '*From the Archives*'.

Previous archive features have used images from the British Geological Survey's own collection of survey photographs. BGS is also the custodian of the British Association for the Advancement of Science archive of geological photos, which numbers over 9000 images dating from 1861 to 1945. This photo of the Hemlock Stone, taken in 1890, is from that collection. Like almost all photos or drawings of the Stone, it shows the pillar from the south, its narrowest and most spectacular perspective. The pillar is in fact several metres broad along its north-south axis, but it is an imposing feature from any viewpoint.



The Hemlock Stone (BAAS photo #1488, British Geological Survey Library). We have no information on the people in the photograph, nor on the event they were attending. Can any readers help? If so, we will publish a note in the next issue.

The Hemlock Stone lies on the eastern side of Stapleford Hill (at NGR SK499386), to the west of Nottingham. The hill is underlain by Permo-Triassic sandstones of the Sherwood Sandstone Group. The Lenton Sandstone Formation (formerly Lower Mottled Sandstone) forms much of the slopes, with the basal beds of the Nottingham Castle Sandstone Formation (formerly Bunter Pebble Beds) forming a thin capping on the Hill. Almost all descriptions mention that the Hemlock Stone is composed of 'Bunter Pebble Beds', but the reality is rather different. The sandstone platform on which the pillar stands, plus the lowermost 2 m part of the pillar itself (up to the heads of the tallest figures in the photograph) is in fact in the Lenton Sandstone Formation, a deep red-brown, very fine-grained cross-stratified sandstone. The rest of the pillar (abou 7 m) is in the overlying Nottingham Castle Sandstone. This is a yellowish grey, medium to coarse-grained, cross-stratified sandstone with common large mudstone clasts. Extraformational quartzite pebbles, typical of this sandstone, become common towards the top of the pillar. The Nottingham Castle Sandstone part of the pillar is strongly cemented by the mineral baryte (barium sulphate), but the underlying Lenton Sandstone Formation is not, and retains the characteristic, very friable texture seen elsewhere in this formation in the Nottingham area.

Theories abound about the origin of the Hemlock Stone, ranging from the supernatural to the scientific. Many have been documented in a well-researched booklet on the Hemlock Stone by R W Morrell, a former Secretary of the EMGS. Familiar old chestnuts such as druids, ley lines and demonic activity have all appeared in various interpretations. The views of medieval scholars are the most entertaining. They maintained that the Devil hurled the Stone into place from Castleton in Derbyshire, in irritation at the chiming of local church bells. Most readers will no doubt discount this theory on intuition alone, but sticklers for a scientific refutation should note that there is no Triassic sandstone at Castleton.

The Nottingham Castle Sandstone was originally deposited as a pebbly, fluvial sand by a major, possibly seasonal, river in a semi-arid continental drainage basin, perhaps like the Murray-Darling Basin of present day Australia. Baryte is an authigenic cement that was precipitated in localised zones within the formation during burial diagenesis, partly by corroding and replacing detrital feldspar sand grains. Pore-filling carbonate cements, principally ferroan calcite and dolomite, were formed at about the same time and probably pervaded the entire formation. Most of these carbonate cements were subsequently removed by reducing, meteoric groundwaters when the Nottingham Castle Sandstone was exhumed from its overlying cover rocks by erosion during the Tertiary and Quaternary periods. This has left the familiar, weakly cemented, friable pebbly sandstone seen at most exposures today. The baryte cement, due to its lower solubility, resisted this solution process, leaving patches of more strongly cemented sandstone within an otherwise friable rock.

Though geologists agree that the strong baryte cement accounts for the preservation of the pillar, debate continues about the agency responsible for removing the surrounding, weaker sandstone. Was natural erosion responsible, or was the pillar left behind after ancient quarrying activities? According to Morrell, the earliest scientific attempts to explain the origin of the Stone were by William Stukeley in the late 18th century, who was the first to put forward the quarry remnant theory. James Shipman, the foremost amateur geologist in the East Midlands in the late 19th century, favoured natural erosion, especially glacial action, as the cause, an explanation later followed by the Geological Survey in 1908. The current, 'official' BGS view, expounded in the Derby Sheet memoir and also favoured by Frank Taylor in an early *Mercian Geologist* article, is that the Hemlock Stone is a quarrying artefact.

Those favouring the natural erosion theory mainly allude to the lack of any documented quarrying activity in the vicinity. However, even a casual stroll around Stapleford Hill reveals copious evidence of former quarrying on all sides of the Hill and around the Hemlock Stone itself. This includes several old quarry faces and spoil heaps in various states of degradation, indicating a long history of quarrying. Extraction seems to have favoured the Lenton Sandstone Formation, possibly for use as a moulding sand, but the Nottingham Castle Sandstone was probably also won in lesser quantities. It is easy to visualise how, once quarrying had exhumed the baryte-rich sandstone from its softer rock surroundings, it would have been impossible to work the Stone pillar further for fear of toppling it, with possibly catastrophic results. Interestingly, the baryte-cemented upper part of the pillar still bears a coating of industrial grime that probably pre-dates modern air pollution controls, indicating negligible erosion. The lower part, in the friable Lenton Sandstone, has no grime coating and is actively eroding at present. This will eventually undercut the pillar and cause the entire upper part to fall *en masse* - but visitors are safe at present!

Andy Howard, British Geological Survey

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VALE

Bill Sarjeant 1935-2002

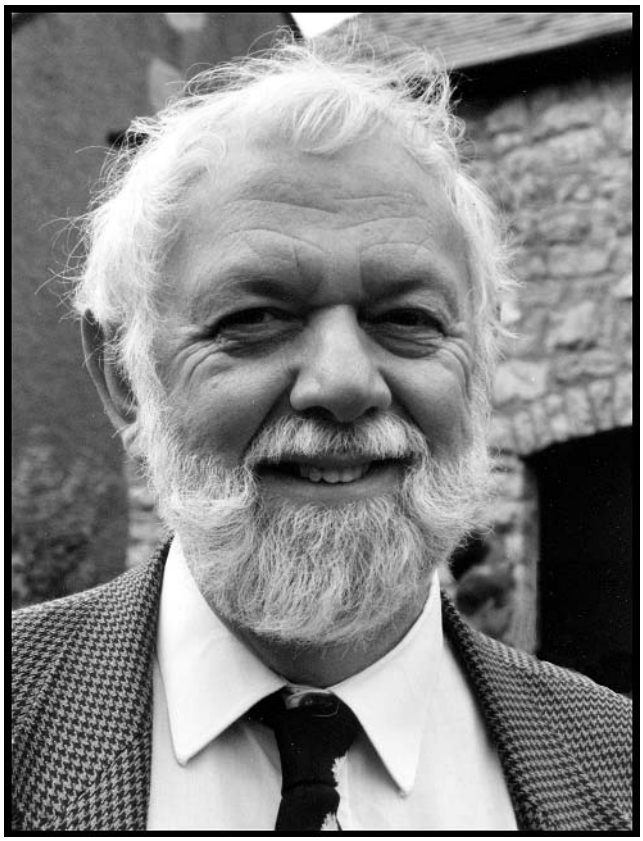
Well known to many members of the Society, William Antony Swithin Sarjeant, DSc., FRSC was both a micropalaeontologist of international repute and a very sociable eccentric with a diversity of interests. In 1956, he gained a geology degree at Sheffield University, his home town, when, because he was born on St. Swithin's Day, he added his third forename by deed poll in time for it to appear on his degree certificate. He then stayed on to gain a PhD on the topic of *An investigation of the palaeontology and stratigraphical potentialities of the micro-plankton (dinoflagellates and hystrichospheres)* in the Upper Jurassic. In his time at Sheffield, he edited the Sorby Record for the natural history society and also the Students' Union newspaper.

Academic positions followed at the Universities of Keele, Reading, Nottingham and Oklahoma, until April 1972, when he became Professor of Geology at the University of Saskatchewan in Saskatoon, where he stayed for the rest of his life.

His research work focused on the study of marine microfossils and on the history of the earth sciences, fields in which he was widely published and recognized. He later expanded his studies to include fossil footprints. Also in 1972, he was awarded a DSc by Nottingham University. His submission consisted of 119 items, including 66 papers on fossil micro-plankton and 31 papers on his other interests in mineralogy, petrology and trace fossils. A citation at the time stated that … his contribution during the last 20 years to the study of fossil micro-plankton is probably unequalled. This despite losing much of his research material in a fire at Nottingham University, which cooked his palynological samples beyond redemption. In the 1980s, he compiled a massive bibliography of the history of geology, in ten volumes.

He was a founder member of the East Midlands Geological Society in 1964. He led the Society's inaugural field excursion to the Dudley Canal Tunnel in the same year and addressed the Society on "The Geology of Iceland". He edited the Mercian Geologist from 1964 to 1970, and presented the first foundation lecture to the Society in 1971. His papers in the Mercian covered Calton Hill asbestos, Derbyshire gypsum and Triassic fossil footprints, among many others.

Bill was also a founder member of both the Peak District Mines Historical Society and the American Association of Stratigraphical Palynologists, and was a member of twelve other learned societies. In 1995 he was elected to Fellowship of the Royal Society of Canada.



Outside geology, he wrote fantasy fiction under the name of Antony Swithin and was an avid collector of books. He was an authority on Sir Arthur Conan Doyle, and published a critical analysis of the author's "The Terror of Blue John Gap", with reference to Castleton localities. Folk music was an enduring passion, and he became deeply involved in heritage preservation when in Saskatoon.

He was described in a reference in his earlier years as "A man of loyalty and wide interests (extending from poetry to mineral lore), he is a thoroughly decent chap and an asset to the department; people react differently to his marked streak of naivety and quite unconscious proneness to drop the occasional brick". He was also well known at the Miners Arms in Brassington for his ability to devour entire bowls of pickled onions.

Bill Sarjeant died on July 8th, leaving his wife Margaret "Peggy", daughters Nicola, Rachel and Juliet and two grandsons.

REVIEWS

The Pennines and adjacent areas (British Regional Geology, fourth edition) by N. Aitkenhead, W. Barclay, A. Brandon, R. A. Chadwick, J. I. Chisholm, A. H. Cooper and E. W. Johnson, 2002. British Geological Survey, Nottingham. 206 pages B5, 29 colour photos, 45 figures, 0 85272 424 1, £18.

In the mid-1900s the first 18 of the 20 very popular British Regional Geological guides were published, mostly with two or three editions and many with large numbers of reprints. The original Pennines guide was first published in 1936, with its third edition in 1954. Since then there have been many reprints but until now, no new edition. This was very unfortunate as it was in those last forty years of the century that the science of geology made significant strides with the advent of plate tectonics and many other important advances. These dramatically changed our understanding of our own regional geology. Our wait for a fourth edition of the 'Pennines and adjacent areas' has at long last been answered, and that wait has been well worthwhile.

The area covered by the guide extends from Nottingham northwards to the Stainmore gap, and from the Irish Sea coast in the west across to the Vale of York and the Trent valley in the east.

The present guide is divided into ten chapters, each with different authors who are past and present staff of the BGS. Many of those authors are well known to EMGS members as they have, in various ways, made large contributions to the activities of the society in recent years.

The opening chapter sets the scene in a review of current understanding of the broad aspects of the geology of the region resulting from research in plate tectonics, basin dynamics, sequence stratigraphy etc. This chapter is followed by seven more in stratigraphic sequence from the pre-Carboniferous to the Neogene and Quaternary. Carboniferous rocks, which crop out across a vast part of the region, are rightly afforded four of these chapters, and the considerable influence of the Quaternary on the final moulding and geomorphology of the region is given extensive coverage. All chapters are written concisely, but in a very readable way, and it is surprising how much detail is presented in a limited space. The variations of the sedimentary sequences across the region are dealt with expertly, and the palaeogeographic reconstructions help to stimulate interest in the geological history.

The penultimate chapter on the structure should enhance aspirations of gaining a well rounded knowledge of the geological events that have developed the present geology. Complementing and adding to the story of the region the last chapter is used to demonstrate how those of us who live in the region have been influenced directly or indirectly by the geology. The variety of the mineral resources, their exploitation and influence on the growth of settlements and the potential hazards resulting from the underlying geology are all developed.

This guide is an excellent update on the third edition, and enhances the literature concerning our local area. It is well written throughout, and with the numerous contributing authors it has had to be extremely well edited to make it the cohesive publication it is. The text is augmented with well chosen and numerous text figures and tables. The cover plate of Gordale Scar is most attractive and there are 28 further plates, with variable colour quality, that enhance the guide.

The BGS are to be congratulated for this publication which I thoroughly recommend. It is a quality text for background and general reading, and for those who wish to pursue aspects of the subject further there is a very good bibliography. The selling price is higher than for earlier guides, but there is a wealth of content and, with a separate solid geological map included in the back pocket, it is very good value.

Ian Sutton

Rocks and Scenery of the Peak District, by Trevor Ford, 2002. Landmark: Ashbourne. 96 pages of A5, 39 diagrams, 46 colour photos, 1 84306 026 4, £7.95.

Most EMGS members will have heard one of Trevor Ford's talks or have accompanied him on a field trip and will be aware of his great ability to convey complex scientific concepts in a way that any interested person can understand. In this concise book on the Peak District, Trevor has drawn together many strands of his work, and carried this communication skill to a wider readership. The geological processes that have shaped the area to give rise to what can be seen today are clearly explained in 18 short chapters, each dealing with a rock type, structure or event, for example, limestones, volcanics, the ice age, minerals and mines, and of course caves. This book is a valuable new overview, presenting information (much previously only available in specialist publications) in a very accessible style.

Alan Filmer