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GEOLOGICAL CURATORS' GROUP

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The Group is affiliated to the Geological Society of London. It was founded in 1974 to improve the status of geology in museums and similar institutions, and to improve the standard of geological curation in general by:

- holding meetings to promote the exchange of information
- providing information and advice on all matters relating to geology in museums
- the surveillance of collections of geological specimens and information with a view to ensuring their well being
- the maintenance of a code of practice for the curation and deployment of collections
- the advancement of the documentation and conservation of geological sites
- initiating and conducting surveys relating to the aims of the Group.

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Cover: Photograph of the large 'kidney ore' specimen adjacent to the entrance to the Riverdale Hall Hotel. [See paper by Young *et al.* on pages 473-476]

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VOLCANOES EXPLODE AT THE MANCHESTER MUSEUM: A CASE STUDY OF A VOLCANO THEMED PUBLIC EVENT

by A. Bunney, H. Chalk, A. Edwards, D. Gelsthorpe and B. Sitch

Bunney, A., Chalk, H., Edwards, A., Gelsthorpe, D. and Sitch, B. 2008. Volcanoes explode at The Manchester Museum: A case study of a volcano themed public event. *The Geological Curator* 8 (10): 467 - 472.

It is often difficult to inspire the public about igneous rocks. This case study of a public activity day shows that through working with a range of partners, innovative ideas can bring the subject alive. Experts with objects to handle talked to the public about eruptions and volcanoes, with eruption demonstrations, hands on activities, explosions and artists workshops taking place throughout the day.

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Introduction

It can be difficult to get the public inspired by igneous rocks. This paper provides a case study in which this challenging subject was tackled in innovative ways, to enthuse and excite a family audience.

In November 2007, The Manchester Museum ran a public event entitled 'Volcano Day'. The event included volcano-related object handling, demonstrations and hands-on science based activities. The event was delivered and supported by a range of partners, including: the Geologists' Association, The Hancock Museum and the School of Earth, Atmospheric and Environmental Sciences of The University of Manchester.

Demonstrating a volcanic eruption

The Geologists' Association Curry Fund awarded the museum a grant of £300 to borrow a volcano model from the Hancock Museum. It was felt that a demonstration of an eruption would help bring volcanic rocks alive and provide a focus to the day.

The volcano model was made from a fibreglass cone that came apart and fitted into a family car. The 'eruption' was generated using a series of light and smoke effects which were activated using a remote control.

Pyroclastic flows and gaseous eruptions were simulated in two ways. Firstly, an atomiser generated 'smoke' from a small pool of water in the top of the cone. The 'smoke' then overflowed down the side of the cone, hugging the surface in the same way a pyroclastic flow would behave (see figure 1). Secondly, a Plinian style eruption was achieved by activating a smoke pump (using 'Disco' smoke), this sent a column of smoke into the air (see figure 2). It should be noted that the fire alarm had been isolated in the immediate area of the demonstration.

Lava flows were simulated through a bank of spotlights that gradually turn on in sequence, from the top of the cone to the bottom (see figure 3). The lights then shone through a transparent section of the fibreglass cone. Eventually, all the lights illuminated as if the volcano were in full eruption.

The model was used as part of a demonstration which included details of eruptions that related to

Figure 1. Simulated pyroclastic flow

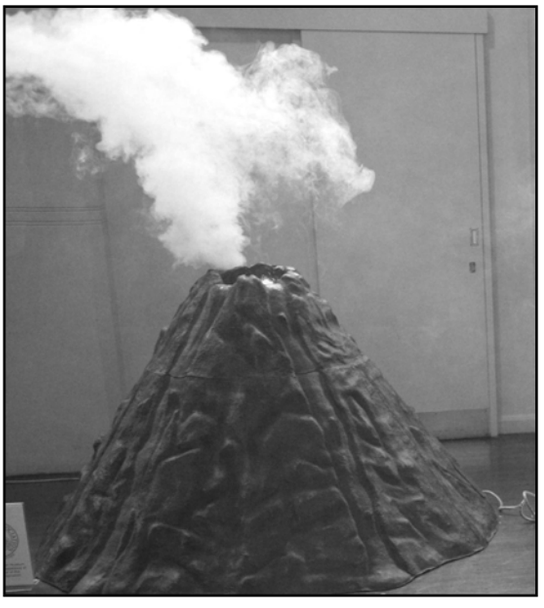


Figure 2. Simulated plinian eruption.

Figure 3. Internal lights illuminate a 'lava flow'.

handling activities taking place elsewhere in the museum. A particular focus was the eruption which destroyed Pompeii in AD 79.

Volcanic objects for the public to handle

A range of specimens from the collection were made available for handling. These focused on eruption structures such as pahoehoe and aa lava, and Pele's hair. A range of intrusive igneous rocks were used to explain cooling rates versus crystal size and other geological phenomena. Postgraduates from the School of Earth, Atmospheric and Environmental Sciences at Manchester University were on hand to help explain their significance.

Susan Brown and her husband from the Geologists' Association represented Rockwatch at the event. They organised a very popular activity which involved making volcano themed dioramas. They had a range of literature on how to get more involved in geology and Rockwatch.

The Manchester Museum holds a number of volcano related artefacts in the archaeology collection. Pompeii, famously destroyed in AD 79 by the eruption of Vesuvius provided antiquaries with a treasure trove of artefacts from a well-known and dated historical event (see figure 4).

Material has been taken from the site since at least the 18th century and many museums have material from Pompeii. The Manchester Museum is no exception. Objects include mosaic tesserae, a slab of dressed marble, a short length of chain, a miniature seat with zoomorphic legs, perhaps for a figurine of a deity; a metal hook; a copper alloy bowl with a removable lid; a copper alloy matrix perhaps for stamping bread with the inscription DEELAREO; three oil lamps from Pompeii and one from Herculaneum and a Greek or southern Italian vase.

Manchester Museum has copies of plaster casts of a human victim of the disaster and a dog, which died still chained up. It was decided that within the con-

Figure 4. Artefacts from Pompeii were demonstrated.

text of the museum's human remains policy it would not have been suitably respectful to display these objects.

It was decided to put out some objects which, whilst not having quite the same sensational appeal of artefacts from Pompeii or Herculaneum, did help to explore the more beneficial long- term aspects of volcanoes from the point of view of human beings. This included prehistoric stone axes and rough-outs from the pyroclastic rocks of Lake District, which show benefit of volcanoes to human beings over the millennia. Other benefits are fertility of volcanic soils is good for grapes in Sicily, Italy and Germany and obsidian used to make a range of different tools.

Volcano day was timed to coincide with a meeting of Manchester Museum's Young Archaeologists' Club. A private viewing of the objects and a demonstration of the volcano model was provided. The older members of the club helped the Curator of Archaeology with object handling.

Partnership with Manchester University's School of Earth, Atmospheric and Environmental Science

The Manchester Museum is part of the University of Manchester and is able to call on the expertise of a wide range of scientists who are experts in their field. Two such experts were on hand to demonstrate some exciting aspects of igneous rocks.

A range of volcanic rocks were available for handling from different volcanoes. These ranged from various types of basalts to examples of spectacular minerals including natural sulphur. Dramatic projections of eruptions helped bring the specimens to life. A popular aspect of the handling session was a microscope showing thin sections of volcanic rocks, which were then displayed on a screen (see figure 5).

One of the highlights of the day was a large 'volcanic' explosion. The demonstration provided onlookers, in an outside courtyard area, with an appreciation of the driving force behind volcanic activity, the evolution of gas from magma at depth, under pressure.

A substantial steel drum was filled with water, (a safer analogue of lava!) and a two-litre carbonated drinks bottle was modified with a metal collar attached to a short chain and a substantial weight which allowed the bottle, when submerged, to float about 500mm from the base of the drum. The bottle

Figure 5. Microscopic views of thin sections of volcanic rocks were displayed on screen, and were very popular.

was partially filled (approximately one-third) with liquid nitrogen and sealed with its screw cap. The drinks bottle was then dropped into the drum, where the heat exchanged from the water rapidly caused the liquid nitrogen to 'boil'. Carbonated drinks bottles are extremely strong, being designed to contain liquids with dissolved gas at modest pressures however, after approximately ten seconds under water, the developed pressure caused by the 'boiling' liquid nitrogen is sufficient to cause a catastrophic failure of the bottle with a resultant violent explosion. The shock wave, constrained by the base and sides of the drum causes a waterspout of up to 30m to be erupted from the open top of the drum. This is accompanied by a pretty loud bang (see figure 6)!

Figure 6. The 'volcanic' explosion.

A short talk was given by Mandy Edwards explaining the significance of the dissolved gas in creating the explosion. A full risk assessment was carried out and the demonstration was conducted by experienced staff.

The tonic water activity and volcano model

No volcano day would be complete without a kitchen sink science activity. So rather than filling the museum with the heady fumes of vinegar and bicarbonate of soda, something a little more explosive was used.

The workshops ran hourly throughout the day and involved visitors 'erupting' a bottle of tonic water. They then made their own volcano, which they could erupt at home.

After briefly discussing how volcanic eruptions occur, an explosive eruption was simulated. This involved using a bottle of slimline tonic water and quickly dropping half a packet of Menthos through a paper tube and into the bottle. The tonic water then erupts out of the bottle, showing the power of expanding gas in a liquid. After demonstrating an eruption, the visitors had a go for themselves. Only one participant sprayed tonic water across the room (and he was a member of staff).

How does this work? When a bottle of slimline tonic water is opened, the pressure inside is released and the CO_2 dissolved in the liquid slowly escapes as bubbles. When the Menthos are added to the bottle of tonic water, two things happen; firstly, the heavily pitted surface of the Menthos gives the sweets a large surface area. This provides a nucleation site for the gas bubbles, which allows the dissolved CO_2 to escape as a gas. Secondly, Menthos contain gum arabica and gelatine. These reduce the surface tension of the tonic water, making it easier for the CO_2 bubbles to form. The formation of bubbles increases the volume of the liquid and the pressure pushes the tonic water out from the bottle.

The second part of the workshop involved the construction of an erupting volcano to take home (see appendix 1).

Partnership with an artist

Volcano day provided an ideal opportunity to work with Ilana Halperin, an artist who was working on the collections as part of the museum's Alchemy project. One of the strands of Ilana's work focused on temporary landscapes created by volcanic events. Using this theme and the collections as inspiration, she lead several drawing workshops for the under 12s. Illana used a power point presentation of images of erupting volcanoes from the museum's lantern slide collection, to inspire the participant's drawings.

In order to engage families when they enter the museum, the Manchester Museum hands out stickers to children. This provides an opportunity to inform visitors what's going on during the day. Our stickers for Volcano day pictured an exploding volcano.

Craft activities also engage younger visitors. In addition to the Rockwatch activities, visitors were also able to make paper models of volcanoes, colour in volcano outlines and solve a volcano word-search.

Conclusion

The success of Volcano day lay in making volcanoes exciting. Key to this were the range of partners that delivered the day.

Bringing volcanoes alive was key to enthusing visitors. One of the central elements of this was the loan of the volcano model, thanks to a small grant. The preparation of the grant application took several hours, but this case study clearly shows the benefit of using the model. The grant enabled the Geologists' Association to target an audience it traditionally finds difficult to reach.

A multi-disciplinary approach to subject of volcanoes broadened the appeal of the day. The constraints of space and number of staff and volunteers were the main limiting factors.

Acknowledgements

We would like to acknowledge the support of the staff and postgraduate students from the School of Earth, Atmospheric and Environmental Sciences at Manchester University, the public program volunteers, The Hancock Museum, The Geologists' Association, The Alchemy project and the Manchester Museum visitor services staff.

Appendix 1

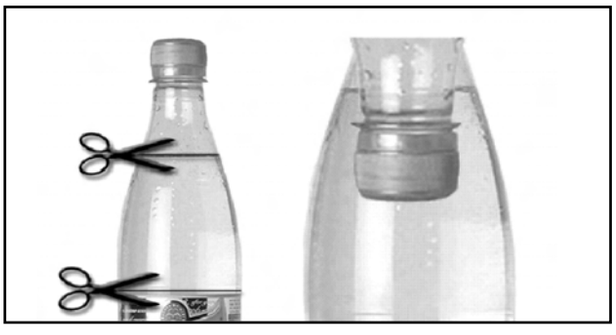
Volcano Recipe

You will need:

- Baking powder / Bicarbonate of Soda
- Red food colouring
- Vinegar (preferably white)
- Washing up liquid
- Water
- Empty plastic bottle

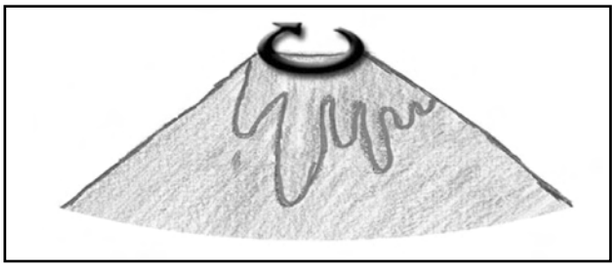
Step 1 - making the cone

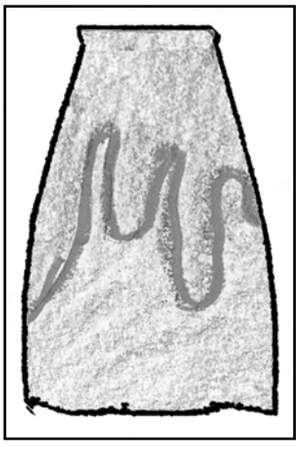
Cut the top off the bottle approximately 2cm below the lid (see figure 7). Turn this up-side-down to represent the magma chamber and place inside the remaining top half of the bottle, cut to size. Secure the upturned top of the bottle with some clay or plasticine to seal the edge.



Step 2 - making the volcano sides

Roll your volcano picture into a cone and put it inside the plastic volcano cone (see figures 8 and 9).





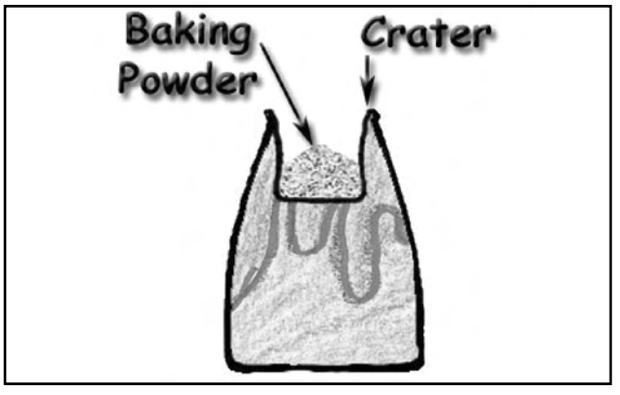
Step 3 - making the activation fluid

To make your activation fluid, pour the following ingredients into your empty plastic bottle:

- 150ml (¼ Pint) vinegar
- 3 tablespoons of washing up liquid
- A few drops of red / orange food colouring

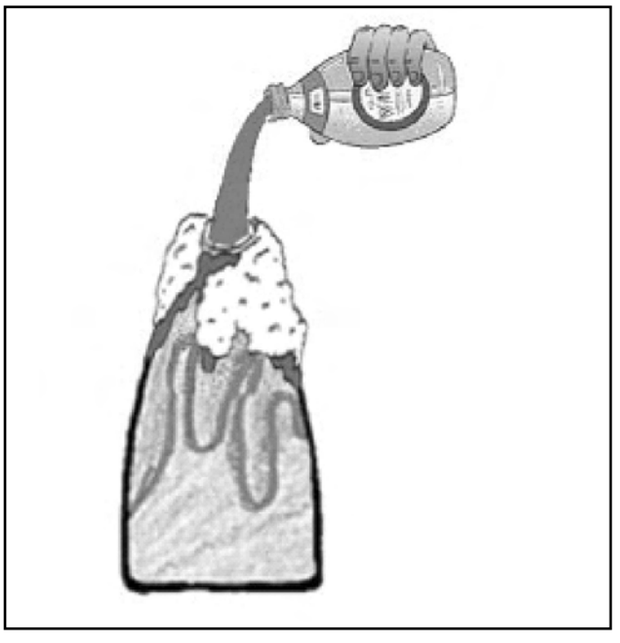
Step 4 - loading the volcano

Carefully spoon the baking powder into the crater making sure that it is no more than half-full (this will use about 2 teaspoons of baking powder) (see figure 10).



Step 5 - erupting the volcano

Slowly pour some activation fluid (see figure 11) into the crater and watch the lava as it flows out of your volcano!



The lava will only erupt if there is baking powder in the crater. When your volcanic eruption has finished, it is a good idea to take out the crater and give it a quick wash before having another go!

Things to try

= Try loading the crater with different amounts of baking powder. How does this affect your eruption?

= Try pouring the activation fluid into the crater at different speeds. What effect does this have?

= Try adding more washing up liquid or some fresh water to the activation fluid mixture. What happens?

How do volcanoes work?

The lava that erupts from a volcano is in fact really hot rock. It is rock that has been heated so much that it has become runny. When this runny rock is underground, it is called magma. Volcanoes form where the surface crust of the earth is weak. This means that the magma can creep up through cracks in the weak crust. When it gets to the surface: BOOM!

A volcanic eruption happens when the magma forces through the surface (like the way that a fizzy drink will spray everywhere if you shake it up before you open it!). The way that a volcano erupts depends on how runny the magma is and much pressure has built up before the magma breaks through the surface. When a volcano erupts, we call the magma a new name: Lava.

Lava quickly cools down in the open air or sometimes, in water. When it cools down, the lava becomes hard again and turns back into rock.

BELLINGHAM HEMATITE: AN IRON ORE MYSTERY

by B. Young, S. Kilby and P. Tandy

Young, B., Kilby, S. and Tandy, P. 2008. Bellingham hematite: an iron ore mystery. *The Geological Curator* 8 (10): 473 - 476.

The origin of fine specimens of 'pencil ore' hematite, in the collections of the Natural History Museum, London, labelled 'Bellingham, Northumberland', has long been enigmatic. Whereas hematite ores are unknown, and unlikely, in the geological setting of the sedimentary ores which were the basis for the local iron smelting industry, several very large blocks of spectacular 'kidney ore' and 'pencil ore' hematite have long been prominent in an ornamental garden at Bellingham, where they prompted fruitless prospecting activity in the 1930s. This investigation has traced the true west Cumbrian origin of these specimens.

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Introduction

The small North Northumberland market town of Bellingham (Figure 1) was, for several years during the 19th century, a significant though rather short-lived, centre for iron ore mining and smelting. It may not therefore seem surprising that a fine specimen of hematite, simply labelled as originating at 'Bellingham, Northumberland' has for many years featured in the systematic display of minerals in the Natural History Museum in South Kensington, London. However, hematite is unknown from this part of Northumberland and the authors' attempts to track down the origins of this specimen have revealed the likely source of this and other specimens of hematite seen today at Bellingham.

Iron ores and the iron industry of the Bellingham area

Clay ironstone nodules are abundant within the Redesdale Ironstone Shales, a mudstone formation that lies between 3 and 12 metres beneath the Redesdale Limestone within the Lower Carboniferous Lower Border Group in the Ridsdale and Bellingham areas of Northumberland (Frost and Holliday 1980). Analyses of the nodules reveal iron contents of up to 36.51% Fe, though in furnace practice the yield was generally around 33% (Strahan *et al*. 1920). Although it is likely that small-scale working of these ores may extend back over many centuries, large-scale working began with the establishment of blast furnaces at Ridsdale in 1839 and at Hareshaw, near Bellingham in 1841 (Atkinson 1974). Originally worked opencast in large quarries, the remains of which are still conspicuous landscape features near Ridsdale, the ores were followed underground where they were extracted using pillar and stall techniques (Lebour 1873; Hemmingway 1972). Iron smelted at the Hareshaw ironworks was employed in the construction of the High Level Bridge across the Tyne at Newcastle upon Tyne. However, the ventures soon proved uneconomic in the face of high transport costs, the discovery of higher quality and cheaper Jurassic ores in the Cleveland area, and the development of better smelting practices at larger operations at locations such as Consett and Teesside (Bell 1864). There are no

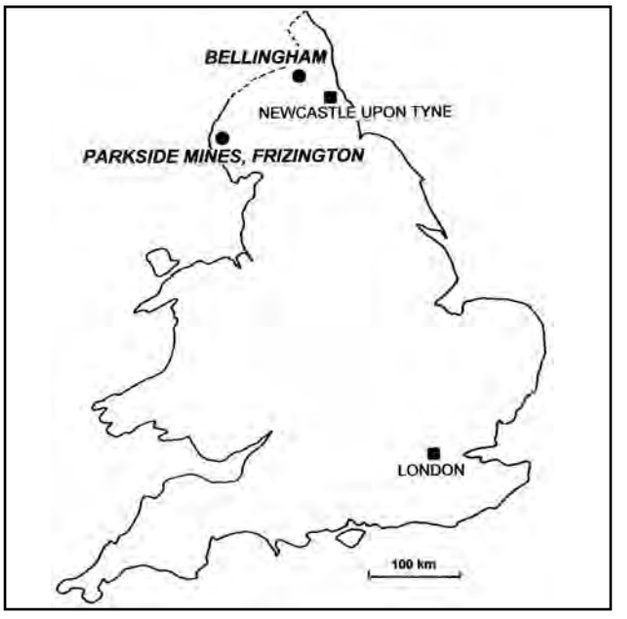

Figure 1. Geographical location of locations discussed in text.

records of iron ores from outside of the Bellingham or North Tyne areas ever being used in the local furnaces. By 1878 the iron industry in this area had ended (Strahan *et al.* 1920).

Bellingham hematite specimens

For many years a specimen of compact finely crystalline purplish grey hematite of the 'pencil ore' variety has been on display as part of the systematic collection of minerals in the Mineral Gallery at the Natural History Museum (NHM), South Kensington (NHM Registration No. BM1937,1486). This, and a very similar specimen (NHM Registration No. BM1937,1487), were donated to the museum in 1937 by a Mr R. Davidson.

Correspondence between Davidson and G. F. Claringbull at the Museum, relating to this donation, and preserved at the NHM, reveals that Davidson was then investigating what he believed to be the occurrence of high quality hematite ore in the Bellingham area. In a letter to Claringbull, dated October 17th 1937, that is accompanied by a photograph (Figure 2) of hematite specimens at Bellingham, Davidson referred to his discovery of blocks of high quality hematite up to 1 ½ tons in weight, which he offered to the museum, though in his reply, dated 21st October, Claringbull declined the offer, advising that the smaller specimens previously donated would "…serve to represent the locality in this collection…" . It seems that Davidson, and presumably also the museum, believed that Bellingham was a credible potential source of these specimens, no doubt partly because of the area's known history of iron ore mining and smelting. However, no more precise location than 'Bellingham, Northumberland' accompanied Davidson's donation.

Several very large, and rather spectacular, specimens of hematite, much of it in the form of 'kidney ore', are still prominent objects in the grounds of the Riverdale Hall Hotel (formerly Riverdale Hall) at Bellingham (Figure 3).

R. Davidson's prospecting activities

The limited surviving correspondence, and more recently obtained local information, reveals that R. Davidson was a mining engineer who originated from Bellingham but who by 1937 was living and working in Kenya. It is also clear that Claringbull and Davidson had met previously, as Claringbull refers in his letter to an olivine dolerite specimen from the 'Blue Reef Mines' left with him by Davidson on a previous visit.

Figure 2. The NHM photograph of hematite specimens at Riverdale Hall, Bellingham., in about 1937. R. Davidson is the figure on the left; the pipe-smoking man on the right is believed to be Sir John Renwick, owner of Riverdale Hall until about 1935: the female figure cannot be identified. The large 'kidney ore' specimen in the right foreground is almost certainly that which stands today by the entrance to the Riverdale Hotel (Figure 3).

In his correspondence with Claringbull on the Bellingham hematite, Davidson uses Bellingham Post Office as his contact address and refers to his present holiday in England being spent "…hunting for hematite etc…". It seems he was re-visiting his home country on leave from Africa, though appears to have been enjoying something of a 'busman's holiday'.

A few older present-day Bellingham residents recall his visit and refer to his interest in locating the source of several very large hematite specimens which for many years had been conspicuously displayed in the gardens of Riverdale Hall (now the Riverdale Hall Hotel), and which he believed must have originated locally. It seems that his donations to the Natural History Museum comprised fragments of this material and that, because of his failure to identify a local provenance, could only offer 'Bellingham, Northumberland' as their source.

Nothing more is known of Davidson or his prospecting interests after his obvious failure to locate the deposit he supposed might await discovery in the Bellingham neighbourhood.

The Riverdale Hall (Hotel) connection

As mentioned above, spectacular specimens of 'kidney ore' hematite survive today in the grounds of the Riverdale Hall Hotel. It is possible, by careful examination of the rather poor quality photograph that

Figure 3. Photograph of the large 'kidney ore' specimen adjacent to the entrance to the Riverdale Hall Hotel.

accompanies Davidson's 1937 letter to Claringbull, to identify the very large piece that today stands near the hotel entrance (Figure 3). There seems no doubt that it was the abundance of these examples of very high quality hematite in the Riverdale Hall grounds that attracted Davidson's attention and provided the basis for his fruitless prospecting activities.

What then was the source of these specimens and how and when did they arrive in Bellingham?

Riverdale Hall was built in 1866 by James Dees. Dees, who was born in Meldon, Northumberland, in 1815, married Ann Gibson of Bellingham in 1842. He trained as a civil engineer and in 1845 became the resident engineer on the Whitehaven and Furness Railway, subsequently becoming chief engineer of the Cleator and Egremont Railway, and in turn Director and Deputy Chairman of the Solway Junction Railway. Dees also had interests in the west Cumbrian minerals industry as proprietor of the Whitehaven Brick Company and later, through his involvement in the partnership of Fisher, Dees and Fletcher, operators of the Parkside Mining Company in Frizington, came to be closely involved in the mining of hematite iron ore.

The Parkside Mines at Frizington were well known in the late 19th century as sources of fine specimens of minerals characteristic of the west Cumbrian hematite orebodies. Perhaps best known, in museums throughout the world, are spectacular examples of large beautifully coloured crystals of baryte (Symes and Young 2008). However, the mines were also a source of superb examples of 'kidney ore' and other forms of hematite. The large 'kidney ore' specimens at Riverdale Hall Hotel are absolutely typical of those formerly found at the Parkside Mines, Frizington, fine examples of which exist in numerous museum collections.

It seems almost certain that the striking large examples of 'kidney ore' that long graced the grounds of Dees' Northumberland home, Riverdale Hall, were brought here from Frizington to serve as garden ornaments. In this context they appear to be unique. Despite the common practice in many British metal-

liferous mining communities of using spectacular large mineral specimens for outdoor decoration, few, if any, examples are known of hematite or any of its associated minerals ever being employed in this way in west Cumbria, though smaller specimens were widely used by Cumbrian miners in constructing 'spar boxes' (Forbes 2003).

Dees died in 1875, and is buried in the Roman Catholic churchyard at Bellingham. Riverdale Hall eventually became the Riverdale Hall Hotel in 1979.

Conclusions

Although Bellingham has long been known as a centre of iron ore mining and smelting, the ores worked have all been typical clay ironstones of sedimentary origin, found as nodules within a restricted part of the Lower Carboniferous succession. Hematite is not known to be a constituent of any of these ores. Moreover, no hematite mineralization of either syngenetic or epigenetic origin is known from any part of the Bellingham neighbourhood. The extremely close resemblance of the hematite varieties present in the grounds of the Riverdale Hall Hotel, together with the history of the building, point to the west Cumbrian orefield, and the Parkside Mines in particular, as the likely source of these fine specimens. Whereas the authors are unaware of specimens of hematite in other collections bearing Bellingham as their source, the results of this investigation may clarify the origin of any similar specimens claimed to be from this location.

Acknowledgements

The authors wish to thank John Cocker, current owner of the Riverdale Hall Hotel, for information on the history of the building and for giving us access to the remaining hematite specimens. Tommy Brecons, of Bellingham is thanked for contemporary recollections of R Davidson, and David Banks of Egremont is thanked for providing information on James Dees. Shaun Eke is thanked for enhancing the archival photograph (Figure 2).

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MICHAEL P. COOPER (1946-2008)

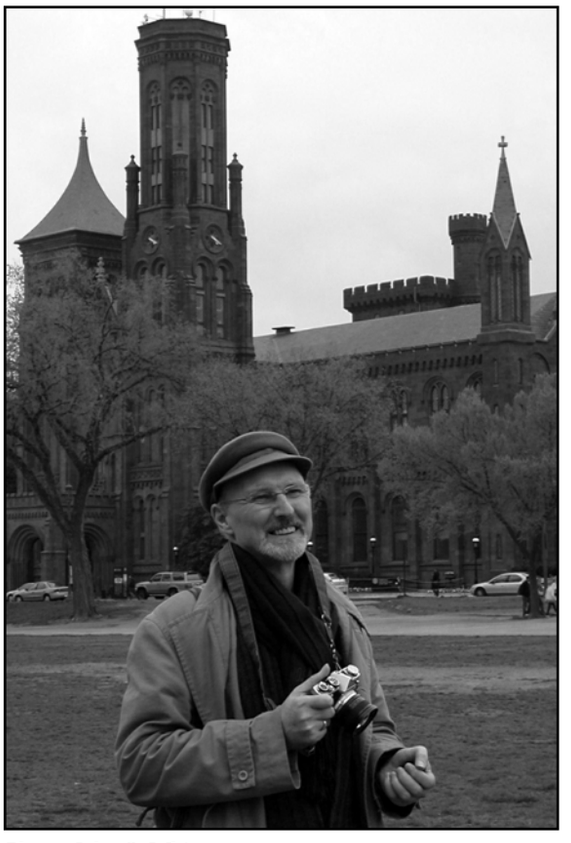

Photo: John S. White

Michael Phillip Cooper, known simply to the mineralogical and museum community as "Mick", was born in Nottingham on October 11, 1946. He was educated at Bilborough Grammar School and having a particular love of the natural sciences went on to read chemistry at the University of Manchester Institute of Science and Technology (UMIST). While studying at UMIST he met up with Richard Braithwaite (then a young lecturer in the Chemistry Department), Tim Greenland, Jim Knight and Terry Seward. All were keen collectors and for a time they pooled their resources, purchasing parcels of mineral specimens from exotic localities and accompanying each other on field trips to Derbyshire and the north of England. Mick's favourite collecting localities were in the Caldbeck Fells and he made numerous visits to the area, the first with Jim Knight in 1965, who remembers saying "someday, someone will write a book about this place...". Mick's final year of study at UMIST was marred by personal tragedy. He lost his father and mother in quick succession and as a result opted out of the chemistry course before graduating, returning instead to the family home in Nottingham to live with his younger brother Peter.

A short spell in industrial research followed, where among other things he developed formulations for coloured inks (once remarking to one of us that you would never pick a coloured pen up again if knew the compounds it contained). Being possessed of a restless intellect, chemistry did not keep his attention for long, and a deep and abiding interest in museums and collections led him to a job at the Portland [art] Gallery in Manchester. During his time at the art gallery a heart problem (a deterioration of the Mitral valve) was diagnosed, and it was quickly apparent that surgery would be necessary. The heart valve was replaced at Wythenshaw Hospital in Manchester and a long convalescence, once again in Nottingham, followed. Mick never returned to work in Manchester, but the city's loss was Nottingham's gain and he set out on a career in documentation with the museum service.

In his spare time, Mick pursued the dual roles of freelance photographer and semi-professional ragtime guitarist. He had a remarkable ability to capture all sorts of subjects on film and by the mid-1980s had become particularly skilled in the field of mineral photography. The Olympus camera company had introduced the groundbreaking OM- system at about this time and Mick was quick to realise the potential of its macro lens system in combination with TTL flash metering.

Mick's mineralogical interests in the 1980s were centred on the Caldbeck Fells and he began to gather data for what would become the first of two major mineralogical works. He knew the area intimately, and not just the minerals, he knew the plants, the animals and the complex history of mining. He had visited the fells many times on field trips with collecting companions, or birdwatching with his brother Peter, who by this time had also died of a brain tumour. This is all the more remarkable as he did not own a car, (or have a driving licence) until almost all of the work for the book was complete, relying almost entirely on friends to take him on field visits. Publication of *Minerals of the English Lake District: Caldbeck Fells*, with Chris Stanley of the Natural History Museum, cemented Mick's position as one of Britain's leading mineralogists. The book remains a benchmark by which other topographic publications are judged. The years of painstaking work visiting archives, collections both public and private, and analysing unusual specimens, combined with the hundreds of hours spent in the field, produced a truly definitive work on this unique mining area. One of the few things he was disappointed with was the title, which was intended to be simply *Minerals of the Caldbeck Fells*.

The excellence of the Caldbeck Fells photography meant that Mick was in great demand as an illustrator. He contributed photographs to many important works including *A Mineralogy of Wales* (Bevins 1994); *Minerals of Scotland* (Livingstone 2002) and *Minerals of Britain and Ireland* (Tindle 2008). He also produced superbly illustrated articles in journals such as *The Mineralogical Record*, *Lapis*, and *The UK Journal of Mines and Minerals*, (which he also edited until 1994 when the pressure of museum work became too much for him to continue). He was an Associate Editor of the *Mineralogical Record* and for a time contributed regular reports from the major European Shows (which he often visited accompanied by Oxford University's mineralogy curator Monica Price). As a consequence of a chance meeting with Jörgen Langhof at the Munich Show in 1993, Mick was invited to travel to Stockholm to take photographs for the now classic book Långban (Holtstam and Langhof 1999). The book features 61 of his finest images and Mick and Jörgen becoming firm friends with a strong interest in the history of mineral collecting.

Mick took a leading role in mineralogical societies from the 1980s onward. He was a member of the British Micromount Society from the early days, and for a time was editor of its newsletter. He was also member of the Russell Society, perhaps the premier organisation in the UK for amateur and professional mineralogists, and was its newsletter editor at the time of his death. Both positions employed his skills as a wordsmith to good effect, he was particularly adept at disentangling other peoples sentences to produce clear and elegant prose.

In gathering information for the Caldbeck Fells book, Mick became very interested in the people who from the mid-eighteenth century onward had supplied collectors with their cabinets of curiosities. He had a standing advertisement in the *UK Journal of Mines and Minerals* which reads as follows: "Wanted for long established archive of MINERAL COLLECTORS' EPHEMERA. mineral dealer's lists, show flyers and catalogues and dealer's labels, articles, etc. Anything, any nationality, but especially British." After publishing several articles on notable mineral dealers in *Matrix*, which is a journal of the history of mineralogy, Mick's second major publication hit the shelves. *Robbing the Sparry Garniture: A 200-year history of British mineral dealers 1750-1950* was launched to critical acclaim in 2006. This truly encyclopaedic work deals with its subject matter with a rigour and breadth unlikely ever to be equalled.

Mick was a member of the Museums and Galleries History Group, and his research interests statement reads as follows: "I am particularly interested in the development of natural history collections, especially mineralogy and botany, particularly through the agency of natural history dealers. Also in Blaschka and other models of natural forms and in early British art galleries (Nottingham Castle has long claimed to be the first municipal provincial museum and art gallery - but was it??). I am also keen to promote the value of museum archives for "introspective" collections research and documentation." Perhaps the project which he was most proud of was the rescue of the mineral collection belonging to the Duke of Devonshire at Chatsworth House (Cooper 2005). This began in 1992 at the twentieth anniversary AGM of the Russell Society. Rumour had it that the Chatsworth collection was extensive and historic,

but none of the committee members had ever seen it, so a visit was arranged. This chance visit resulted in a restoration and rescue project, that spanned more than ten years, and many hundreds of hours of painstaking research and curatorial work. The collection included the now famous Duke's Emerald a crystal presented by the last Emperor of Brazil which had lain undiscovered in an old cardboard box for more than a century. Mick negotiated its loan for public display and it can now be seen in The Vault, a new annex to the mineral display at the Natural History Museum.

Mick's tall distinguished frame was well known to many in the museum world. He was a knowledgeable and witty companion in the field, at a mineral show or behind the scenes when visiting a collection. A scholar with a deep knowledge of his subject areas, he possessed a breadth of knowledge and a facility for expression equalled by few of his peers. At the time of his death, Mick had recently returned from a visit to the Rochester Symposium. He delivered two talks and had wowed the conference delegates with his presentational and research skills. He passed away from heart failure in his sleep on June 2, 2008. He will be remembered as a good friend, a great historical researcher, a first-class mineral photographer, a fine guitar-player and an engaging writer with a brilliant and enquiring mind.

Mick's papers, manuscripts, research documents and dealer label collection will be placed in the library at Oxford University for reference. His slides are to be passed to National Museum of Wales, where in due course they will be available in digital form. Mick is succeeded by his wife Catherine Foley, and sister Kate Whitmore, to whom we offer our deepest sympathy.

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David Green
Roy Starkey
Jim Knight

GEOLOGICAL CURATORS' GROUP

34th Annual General Meeting

National Museum of Ireland,
Collins Barracks, Dublin, Ireland.

3rd December 2007.

1. Apologies for absence.
H. Brunton, H. Chalk, D. Craven, T. Cross, P. Crowther, D. Johnston, S. McLean.

2. Acceptance of the minutes of the 33rd AGM held at Plymouth Museum, December 2006.
Agreed.

3. Matters Arising.
None raised.

4. Chairman's' Report.
The three years that I have spent as Chairman of the Group have passed by very quickly. Looking back at the other reports that past Chairmen have written I have noticed that this thought is a very common one, perhaps it is related in part to the successful way that GCG Committee works with everyone sharing the work load and bringing their different skills and interests to the attention of the Committee and the membership. I am pleased to be leaving the Committee in a very healthy state with committed officers and younger members of the profession on board. May I also encourage anyone who is thinking that it would be of interest to them to consider standing for Committee - after all what have you got to lose by putting your name forward?

One of the successful outcomes for 2007 has been the rationalisation of the holdings of the back issues of the Geological Curator kept in Manchester. We have made sure that there are complete runs at the national museums, large regional museums and in our own archive. Over twenty of our members received near complete sets of the journal for the price of postage. Work has started on the digitisation of the journal and I hope that this would be available from our web site for anyone to read and download for their own use.

Dynamic rationalisation of the collections held in our institutions is a topic that has been discussed in 2007. Geological collections are not easy for a non specialist to assess and it is here that the extensive datasets and expertise that GCG can quickly access that have proved very useful in our dealings with other institutions responsible for geological collections. I am sure that this is an area that will be of concern to the Committee in the future as well.

One way that we can add to the knowledge of our members and the museum profession as a whole is through our provision of meetings and training days. The training days we have organised this year have been very successful and we intend to build on this success and offer more of these courses to everyone. However our general interest meetings have struggled to attract sufficient numbers to make them viable to run. The Committee spend a lot of time trying to make the venues and topics of our meetings relevant to the members of GCG and I must thank Steve McLean who has worked very hard in his role as Programme Secretary. On a personal note I hope that GCG will be visiting further a field again on our study trips.

I am very pleased with the way our web site works now and we are publishing more content on our site all the time. The web site is a very important tool in communicating the group's aims to a wide audience. On a final note I would like to thank all of the people who have helped GCG by serving on the Committee or its smaller working groups and have helped to keep GCG relevant in today's museum profession and I wish my successor a fulfilling, busy and enjoyable three years.
Mandy Edwards (Chairman 2005 - 2007).

Questions from the floor.
Phil Doughty: What is "Dynamic rationalisation"?
Mandy Edwards: The ability to dispose of collections or items from collections in a planned way.
A general discussion took place on specimen disposal. It was generally agreed that institutions need to know as much as possible about their collections before they are de-accessioned as many will be of historic and scientific value. GCG could be used as a way of accessing specialist expertise in researching collections and giving advice on methods other than disposal.
Acceptance of report: Proposed - Susan Cooke. Seconded - Christine Thomson.
Agreed.

5. Secretary's Report.
Three Committee meetings have been held during

the year: 24th January in the Geological Society, London; 24th April and 5th September in the Manchester Museum. Attendances have been good with most Committee members attending all three meetings.

In order to enhance our profile within the Geological Society, and to promote geological curation more widely, Mike Howe has attended several Science Committee meetings and reported back to the Committee to keep us up to date with developments within the Geological Society as a whole as well as representing us in the development of the Geological Society's Science Strategy and other areas. An intention to try to improve our publicity and communication through the Society channels in 2007 was not really achieved, due to lack of time on the Secretary's part.

Very limited progress has been made with the proposed revised Guidelines for Geological Curation, but it is expected that the editorial team of Patrick Wyse Jackson, Tom Sharpe and Matthew Parkes will give this more attention during early 2008.

I would especially like to acknowledge the support of Nigel Monaghan, Keeper of Natural History, National Museum Ireland, and also the National Museum itself, for the invaluable support to undertake GCG activities and attend committee meetings over the past 2 years.
Matthew Parkes.

Questions from the floor:
Mike Taylor (National Museums Scotland).
GCG Committee should bear in mind certain new and forthcoming legislation and related matters.
1. The Scottish Fossil Code, required by the Scottish Parliament to cover the disposition as well as the collection of fossils, is now imminent, and accordingly includes sections on collections care and on museums and other repositories. It does not have the force of law but is supplementary to the Nature Conservation (Scotland) Act 2004 and will have the effect of defining good practice.
2. Possible changes to import-export law, comprising a forthcoming review of the export control regulations for cultural objects, and an apparent review of the English legislation which effectively makes it illegal to deal in or handle antiquities which were collected illegally abroad. If this is extended to fossils and other objects it will be highly relevant to museums.
Acceptance of report: Proposed - Phil Doughty. Seconded - Steve Thompson. Agreed.

6. Treasurer and Membership Secretary Reports.
Hand-over of the GCG accounts to the new Treasurer took place at last years AGM, and thanks go to Helen Kerbey, our previous Treasurer, for passing them on in good order, and for the willing advice, often sought in the early months of my reign.

I am pleased to report that income has gone up, and expenditure down, in almost all the categories on the accounts. Subscriptions have risen by over £1100, and while this was in part due to the increase in subs agreed at last years AGM, it is mainly due to the tenacity of the Membership Secretary, Cindy Howells, who has ensured that every member is now fully paid up. Thanks to Cindy, our membership list has at last been tightened up, and every member who had not paid for the past 3 years has been contacted and has either now paid the arrears or has been struck off the records. Non-payers in future will receive prompt reminders.

Income from workshops is up by £900, such that these are no longer loss makers, and a further substantial income of almost £1400 has resulted from three retrospective Gift Aid payments. Please ensure that you have filled in the Gift Aid form if you are a tax payer, as this brings in c. £500 to the Group.

Expenditure is also down, largely due to a reduction in printing costs for the Geological Curator, for which we are indebted to Matthew. The only expenditure which continues to rise are the travel costs for members attending Committee meetings. As reported by Sara Chambers in 2004, this is largely due to the continued unwillingness of our paymasters to value the work of the group by supporting staff attendance on Committee.

Balance in hand now stands at £8628, compared with £6258 this time last year. In addition our US Dollar account now stands at $1687, while our new Euro account currently stands at 163.

Grateful thanks are due to Caroline Buttler (Cardiff) and David Green (Manchester) for the onerous task of auditing the accounts, and to Tiffany Adrain for looking after the US Dollar account from her base in Iowa.

Cindy Howells, as Membership Secretary, has dealt with all membership enquiries and reports the following current membership totals (2006 figures in brackets):

Geological Curators' Group
34th Annual General Meeting, Dublin 03/12/2007
2007 Accounts 27/11/06 - 23/11/07

Income			**Expenditure**		
Subscriptions	£ 4,705.74	(3568.96)	Geol Curator	£ 2,212.80	(2803.56)
Seminar and workshop fees	£ 1,270.00	(370.00)	Coprolite	£ 1,528.44	(1542.20)
Gift Aid[1]	£ 1,381.88	-	Seminars and workshops	£ 543.15	(656.31)
Donations	£ 26.00	(12.00)	Committee expenses	£ 618.72	(328.22)
			Bank charges	£ 15.00	(80.50)
			Web site fees	£ 96.01	(62.02)
	£ 7,383.62			£ 5,014.12	
Balance as at 27/11/2006	£ 6,258.75		Balance as at 23/11/2007	£ 8,628.25	
	£13,642.37			£13,642.37	

NOTES
[1]Gift Aid for 2004/5, 2005/6 and 2006/7 = £432.92, £529.27 and £419.69 respectively

American Account currently at $ 1687.42
European Account currently at 163.37

Auditors: David Green

J R Nudds Treasurer 27/11/2007

Caroline Buttler

UK Personal	172	(170)
Overseas Personal	18	(13)
UK Institutional	62	(69)
Overseas Institutional	27	(27)
Honorary	8	(8)
Total	287	(287)

(We have had 18 new members during the year, balanced by some cancellations).

Questions from the floor.
Patrick Wyse Jackson: There appears to be a general downward trend in the Group's balances. Would it be better to distribute the newsletter and journal by electronic means such as pdf format or publish in Meta-subscription format? This latter could provide income from downloads.

Mandy Edwards commented that electronic formats have been discussed in Committee and that all forms have advantages and disadvantages.
Acceptance of report: Proposed - Nigel Monaghan. Seconded - David Gelsthorpe.
Agreed.

7. Programme Secretary's Report.
None received.

8. Journal Editor's Report.
Since taking over editorship of the journal from Patrick Wyse Jackson, Volume 8 Part 7 was issued with a thematic set of papers arising from last years Seminar on Learning with geology collections organised by Helen Fothergill in Plymouth. Thanks to all the contributors for promptly responding to my queries. The small delay in issuing this arose from a printing problem. Volume 8 Part 8 is largely ready to go to the printers in December and should be issued soon.

All contributors to this Local Heroes Seminar have been asked to submit their papers in written form for the journal and the next issues in 2008 should include a number of contributions from this meeting. Papers are always welcome, as would be more use of the journal for lost and found items, book reviews, collection label series, fact file, notes and so on. All members are encouraged to contribute. Thanks are due to David Craven for agreeing to deal with book reviews and I would encourage anyone with books to review, suggestions for new titles that would be of interest to reviewers to contact David directly. Thanks are also due to the printers at Leinster Leader.
Acceptance of report:
Proposed - Tom Sharpe. Seconded - Cindy Howells.
Agreed.

9. Newsletter Editor's Report.
2007 saw the completion of the 18th year of publication of Coprolite. As usual, three issues (Number 52, 53 and 54) were published, in March, June and November, totalling 42 pages (compared with 34 last year and 52 in 2004).

For Coprolite to fulfil its role as a newsletter, it needs to have some news. Any news of events, meetings, exhibitions, new acquisitions, publications, staff changes and job moved, or anything at all relating to geology in museums would be very welcome. Do tell us what you and your museum are doing.

Thanks are due to Barnes Print Group of Nottingham who print and distribute Coprolite and always send it out on time.
Acceptance of report:
Proposed - Alan Howell. Seconded - Jean Archer.
Agreed.

10. Website Editor's Report.
The GCG website has continued to develop over 2007 with a new easy to navigate design. New issues of Coprolite are available on-line and a wide range of geological resources are now included. The number of website visits is progressively increasing month on month, with 1205 visits from around the world in 2007. New developments in the coming year will include making Geological Curator available on-line and the ongoing development of the resources.

Please let me know if you have anything you would like to include on the website.
Acceptance of report:
Proposed - Cindy Howells. Seconded - Lyall Anderson. Agreed.

11. Recorder's Report.
Education Survey.
GCG conducted a survey into the relationship between natural history curators and education staff in museums. The survey was posted on the GCG, NatSCA and GEM discussion groups, and the results published in Geological Curator. The results suggest that curators and education staff could work more closely to help each other and to share skills. The study also highlighted the disparity in the provision for natural history between the Key Stages, with KS1 to KS3 being widely catered for while fewer museums cater for KS4 and KS5.

Back issues.
We have used the list of institutions who responded to our "State and Status" survey as a basis for inform-

ing organisations and people about the availability of back issues of the Geological Curator. If you have not received such a mailing then please contact Helen Fothergill.

Workshop Survey.
In order to determine what type of workshops members wanted us to run, a list of possible topics was circulated. The responses were interesting, with general topics rather than specialised ones being most popular at the moment, for example; imaging for geological collections, storage, collections and on-site conservation.

Other suggestions include: vertebrate palaeontology, identification of bryozoans, and guidelines on where to go for historical research. Many of those who responded asked for more events to be held in Scotland or the North of England.

Current work.
Work is continuing on revising the Directory of British Geological Museums (Nudds, 1994). SPNHC have asked us to produce a document on specimen conservation as part of their "How-to" series of leaflets.
Agreement of report: Proposed - David Gelsthorpe. Seconded - Steve Thompson.
Agreed.

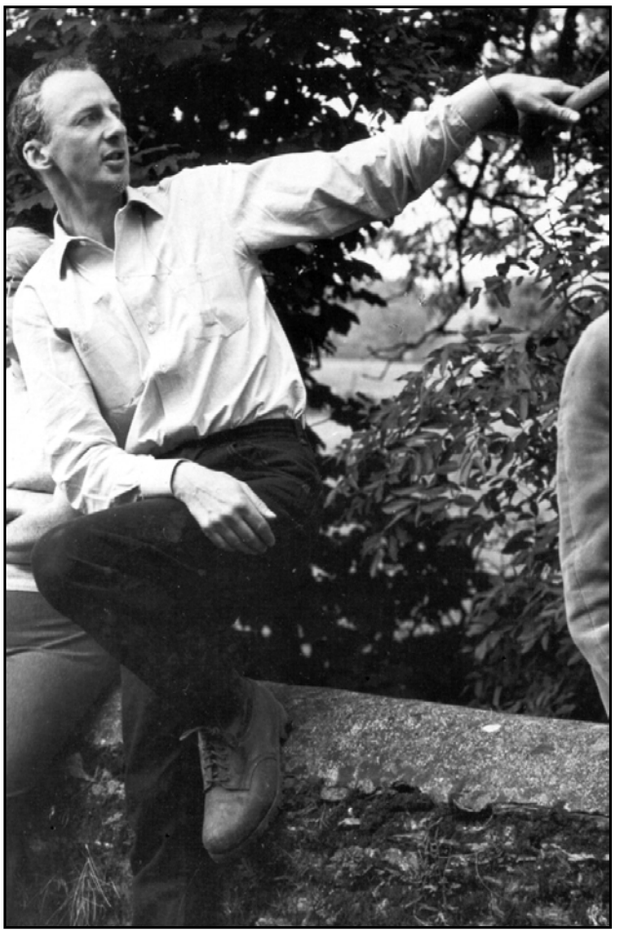
12. Election of Officers and Committee for 2008.
No nominations have been received from the wider membership for any posts.
The Committee propose the following: Chairman - Helen Fothergill. Recorder - Mike Howe.
Both changes agreed by the meeting.
All other Committee members and co-opted members have agreed to continue for 2008.

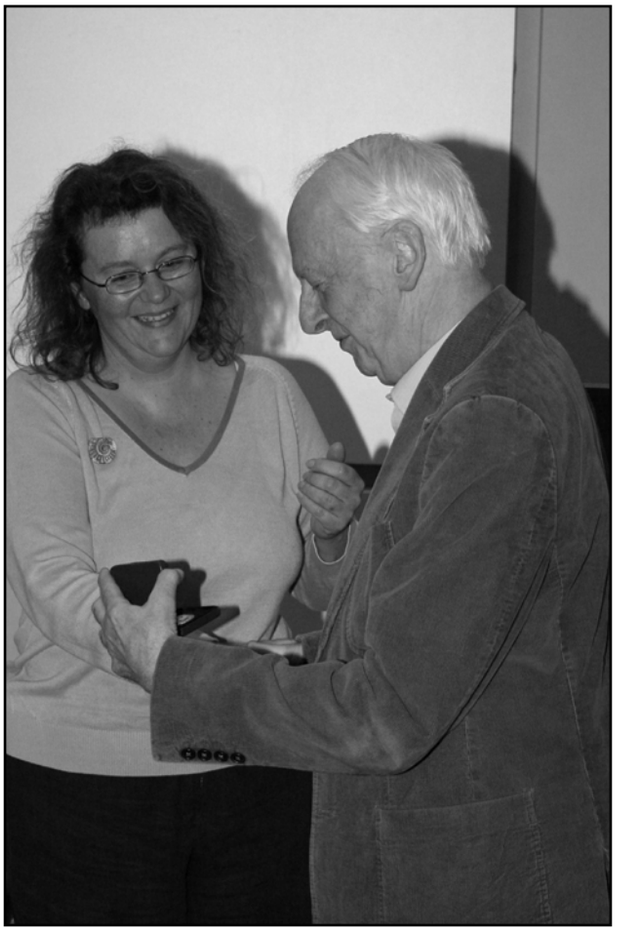
13. Proposal to confer Honorary Life Membership on Philip Powell.
All previous recipients of the Brighton medal have subsequently become Honorary members of GCG. The Committee needs the approval of the AGM to confirm this for Phillip Powell.
Agreed.

14. Any other business.
None.

15. Date and venue for the next AGM.
Monday 1st December 2008.
University of Portsmouth.
Seminar theme: "A new look at old fossils".

PRESENTATION OF THE A.G. BRIGHTON MEDAL TO GEOFFREY TRESISE





Address by Mandy Edwards, Chairman of the GCG at the GCG AGM, National Museum of Ireland, Dublin, 3rd December 2007

One of the final responsibilities of the term in office of the Chairman of GCG is to award the AG Brighton medal at our AGM meeting. The medallist is a counselled choice of the Chairman who awards the AG Brighton medal to recognise actual achievement over a long period. The recipient of the award in 2007 is Geoffrey Tresise.

Geoff is known for his work at Liverpool Museum where he started in 1960. Although he retired in 1996 Geoff is still working on the collection which means that he has accumulated 47 years so far with the collections at Liverpool.

When he began Geoff inherited a collection that had sustained damage during the Second World War. An incendiary device which landed on an adjacent building caused a fire which destroyed many specimens. Was this the most severe form of dynamic rationalisation that a curator has to face? From 1951 until 1960 there was no geological curator on the staff at the museum. The remnants of the collection were packed away until they could be moved back to the museum when Geoff was appointed. Work began on the long term process of examining and listing the collections. Improvements in the storage of the collections allowed Geoff to start acquiring new specimens for the collections. Hundreds of specimens were bought using the War Damage Fund and Geoff also participated in a Geologists' Association expedition to the Harz Mountains of Germany to collect rocks and minerals for the museum. Wendy Simkiss the current Assistant Curator for the collection has written that "Looking at the modern collections, many of them have labels in Geoff's handwriting, demonstrating how much curation work he has done over the years. It is Geoff that has been responsible for our large number of Triassic *Chirotherium* and

Rhynchosaur footprints, gemstone collections and Northern England Mineral collections."

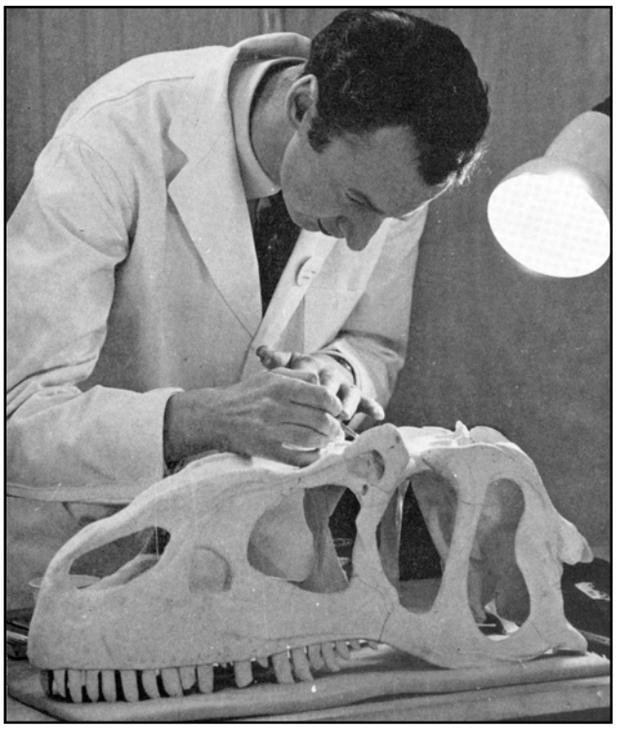
Geoff has written many papers throughout his career and they reflect the specialisations he has adopted over the years. His early work included several papers on the Greensands of Wessex. He moved onto the relationships of geology and wine in the 1980s but the majority of his papers and the subject that Geoff is probably best known for is his work on the *Chirotherium* footprints of the British Triassic, particularly those of Cheshire and Merseyside. One of his papers has quite an infamous title "Sex in the footprint bed" *Geology Today*, 12, 1, 22-26, 1996 which, although sounding like an Alan Titchmarsh novel, is actually a paper about sexual dimorphism as shown by his beloved *Chirotherium* tracks. One of his most recent papers published in 2003 is a review of the early work done by George Morton and Henry Beasley on the classification of Triassic footprints.

From his earliest days at Liverpool Geoff has been involved in developing and curating the displays at the museum. His interests in both dinosaurs and footprints are reflected in the dioramas, including the gallery "Earth before Man" which is still on display today. Perhaps the most popular display Geoff was involved in was "Dinosaurs Alive" in 1995 which featured some very temperamental robotic dinosaurs.

Geoff has also been a pioneer in the educational fields running a five day vacation course for geology students which included fieldwork. He was also part of the team who established the recently renamed Clore Natural History Centre, after a long series of experiments in open access to Liverpool's collections known as "What's in Store?" It was Geoff who re-established the teaching collections and built them up after the success of the 19th Century Circulating Museum.

Geoff's contribution to various professional groups associated with both museums and geology has been notable. Geoff is already an Honorary Member of the GCG. He was the on the GCG. committee following the Group's foundation in 1974, and was Secretary from 1981-1987. Geoff has also been member of the Geologists' Association and joined the Liverpool Geological Society soon after arriving in Liverpool and was quickly elected to the LGS council. He is still on the council today. He has been a member of the Geological Society for over 50 years and has recently been awarded an Honorary Fellowship. He was a member of the Museum Assistants Group where he was vice-chairman in 1966. Geoff has also been an examiner for the Museums Association. There are many of us working in museums and with geological collections today who gained their diploma qualification with Geoff as their supervisor.

Following his retirement in 1996 Geoff has returned to the Earth Sciences section of the renamed World Museum Liverpool. He still writes papers and articles, gives the younger staff the benefit of his knowledge, and is, most importantly still identifying; numbering and cataloguing the collections. With Geoff's dedication, knowledge, and despite his ambivalence to computers the collections and their documentation have grown substantially over the 47 years he has been associated with Liverpool. He is still actively working on the collections and is still connected to the wider museum community through his work with the friends of the Museum group, recently becoming its Secretary. He is still doing what he enjoys most, working with collections, and for museums, which is what being a Geological Curator is about. So it is with great pleasure that I present the AG Brighton Medal to Geoffrey Tresise.



The Geological Curator

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