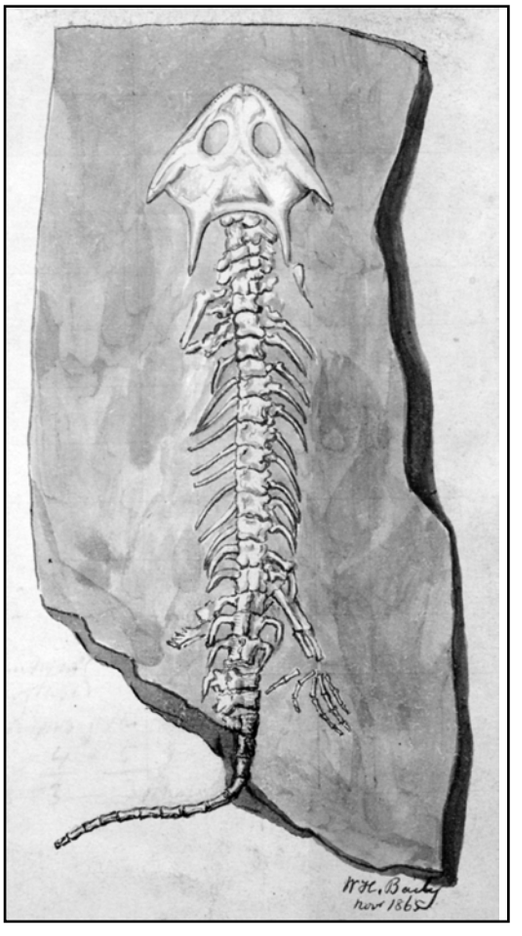
GEOLOGICAL CURATOR

Volume 9 Number 2



GEOLOGICAL CURATORS' GROUP

Registered Charity No. 296050

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.

2009 COMMITTEE

 ISSN 0144 - 5294

Cover: Watercolour of the Pennsylvanian (Upper Carboniferous) amphibian *Keraterpeton galvani* Huxley, 1867 from Castlecomer, Co. Kilkenny showing a conjecture of the tail length, November 1865. (GSI archives). [See paper by Wyse Jackson and Parkes on pages 57-84]

THE GEOLOGICAL CURATOR

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CONTENTS

LOST & FOUND

Enquiries and information, please to Matthew Parkes, (National Museum of Ireland - Natural History, Merrion Street, Dublin 2, Ireland; e-mail: mparkes@museum.ie). Include full personal and institutional names and addressess, full biographical details of publications mentioned, and credits for any illustrations submitted.

The index to 'Lost & Found' Volumes 1-4 was published in *The Geological Curator* 5(2), 79-85. The index for Volume 5 was published in *The Geological Curator* 6(4), 175-177.

Abbreviations:

CLEEVELY - Cleevely, R.J. 1983. *World Palaeontological Collections*. British Museum (Natural History() and Mansell Publishing Company, London.
GCG - *Newsletter of the Geological Curators' Group*, continued as *The Geological Curator*.
LF - 'Lost & Found' reference number in GCG.

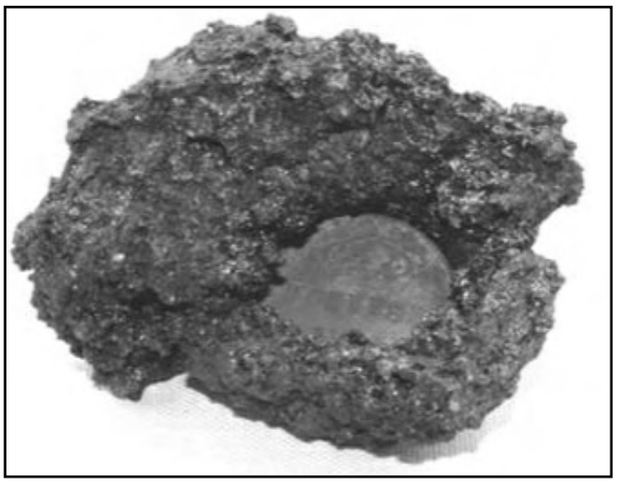
265. Coins in lava

Simon Howard, Curator of Petrology, Geology Department, National Museums Collection Centre, National Museums Scotland, 242 West Granton Road, Edinburgh EH5 1JA, Scotland, UK; Tel: 0131 247 4489; email: s.howard@nms.ac.uk

The NMS has a couple of specimens of coins being impressed into lava and other uses of lava as souvenirs. However we have had two of the specimens go missing.

The first specimen:
Catalogue number G.1924.4.74
Lava - greyish brown with the lettered impression "SALVATORE MADONNA " and "1844"
Locality unknown.
Size L 112 mm x W 99 mm x H 24 mm Weight 226.40 grams.

G.2004.39.26
Lava with a Francesco 1 (1825 - 1830) coin imbedded. The reverse inscribed with a crown and the words "TORNESI DIECI" from Italy.
Size L 96 mm x W 79 mm x H 65 mm Weight 245.59 grams (although the weight and appearance of the item will have changed as part of the specimen was broken off and left behind).



The items went missing between the 12th and the 14th of September 2008.

If anybody has any information or comes across these specimens could you please contact me?

Thanks & Regards
Simon

THE SIR ABRAHAM HUME DIAMOND COLLECTION IN THE SEDGWICK MUSEUM, CAMBRIDGE

by G.E. Mallett, S. Finney and G.A. Chinner

Mallett, G.E., Finney, S. and Chinner, G.A. 2009. The Sir Abraham Hume Diamond Collection in the Sedgwick Museum, Cambridge. *The Geological Curator* 9 (2): 39 - 44.

The Sir Abraham Hume diamond collection in the Sedgwick Museum, Cambridge is described. With an original catalogue dating from 1815, it consists of 154 specimens which demonstrate the crystallography, colour, inclusions and general nature of diamonds. The paper describes a restoration and conservation project on the collection.

Mallett, G.E., Finney, S. and Chinner, G.A., The Sedgwick Museum, Downing Street, Cambridge, CB2 3EQ, UK. Received 20 July 2009.

Introduction

The educational value of museums is today taken for granted. Viewing them in their historical perspective is also valuable, for the study of keynote collections centuries ago led to the databank of knowledge today. Museums began as collections of curiosities from travellers and traders later sold onto the rich and cognoscenti. Early important collections initiated in the 17th century include those of John Woodward, now the nucleus of the Sedgwick Museum at Cambridge, and the Tradescant Collection of the Ashmolean Museum at Oxford. By the 18th century noblemen and landowners were collecting from their estates, especially minerals and plants which might be commercially exploitable; such "cabinets" stimulated enquiries into the natural world, leading to theories of basic natural history and evolution.

Collecting also became a vogue for show and status among the wealthy. One of the finest 18th century mineral collections, that of Sir Abraham Hume, numbering over 5,000 choice specimens, was however amassed as much for use as for ostentation. Hume, a member of the Royal Society, was a serious mineralogist and natural historian. As a founder member of the Geological Survey of London (1808), he "was at all times one of its most strenuous friends and most liberal supporters, and especially in its earliest periods when such aid was of the most value" (Whewell 1839). Hume had corresponded with the noted mineralogist Jacques Louis, Comte de Bournon before the French Revolution and when Bournon fled the Terror, welcomed him with sanctuary, sustenance, and friendship. Bournon repaid this hospitality not only by naming in his friend's honour the mineral humite but also by preparing a systematic and discursive catalogue of the Hume Collection. Written in elegant Italianate script and illustrated with drawings of selected crystals, the catalogue was bound in the series of handsome leather volumes which survive in the Sedgwick Museum at Cambridge. The only catalogue of the diamonds is a copy of the second pub-

Figure 1. Portrait of Sir Abraham Hume (reproduced with permission from the Tate Gallery).

Figure 2. The cabinet in which the collection is stored.

lished English edition of 1815-1816. The section on calcite formed the basis of de Bournon's book "Traité complet de la Chaux Carbonatée" of 1808.

That the Hume Collection came to Cambridge rather than being broken up for sale on its creator's death is chiefly due to William Whewell, Professor of Mineralogy 1828-1832. Whewell's overwhelming legacy to the science was his mathematically manipulable notation relating crystal faces to standard axes. This "hkl" notation was adopted and publicised by Whewell's student and successor William Hallowes Miller, and now known as Miller Indices, is indispensible today in X-ray crystallography. By the time that Hume died in 1838, Whewell had become well connected and was soon to be appointed Master of Trinity College; he played a crucial role in negotiating the gift of the Hume Collection from its new possessor, Hume's grandson and heir Viscount Alford. In 1841 the specimens were all boxed under Miller's supervision and transported from the Hume Mansion, Wormleybury near Broxbourne, to Cambridge.

Restoration

The individual diamond crystals in the Hume Collection were mounted on pegs. When the Collection was examined in September 2005, 52 of the 154 pegs had no diamond attached. There were 34 loose stones in the bottom of the box and another 6 (from known numbered pegs) were on display in the Whewell gallery of Sedgwick Museum. Restoration work was clearly needed.

As the collection had its original catalogue dating from 1815, it was very important to re-fix the loose stones on their correct numbered pegs. This involved careful study of the catalogue description of those diamonds still fixed to pegs to understand the way in which they were described in 1815 and relate this to the way the loose diamonds would have been described at the time.

This led to a step matching of loose diamonds to the descriptions using the patchy information in the catalogue to maximum advantage. The interesting variety of the crystals in the collection helped greatly and made matching possible for all but one loose crystal which must be one of the undescribed numbers (144-154), at the end of the catalogue with three possibilities, 144, 148 or 149. In the end it was assigned peg 144.

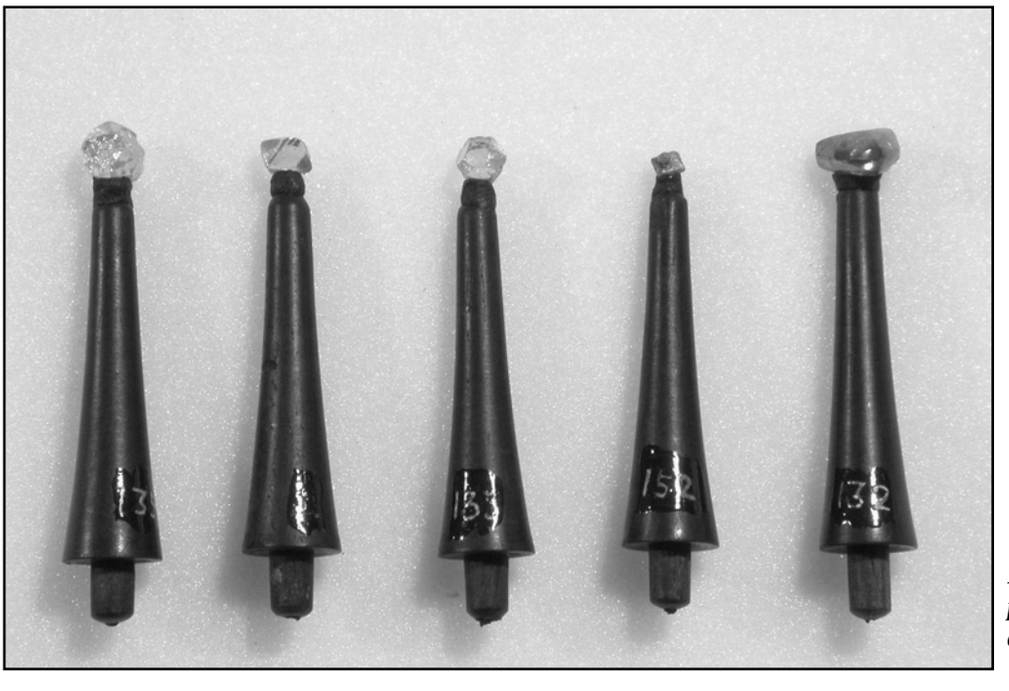


Figure 3. Some examples of the individual diamond on pegs.

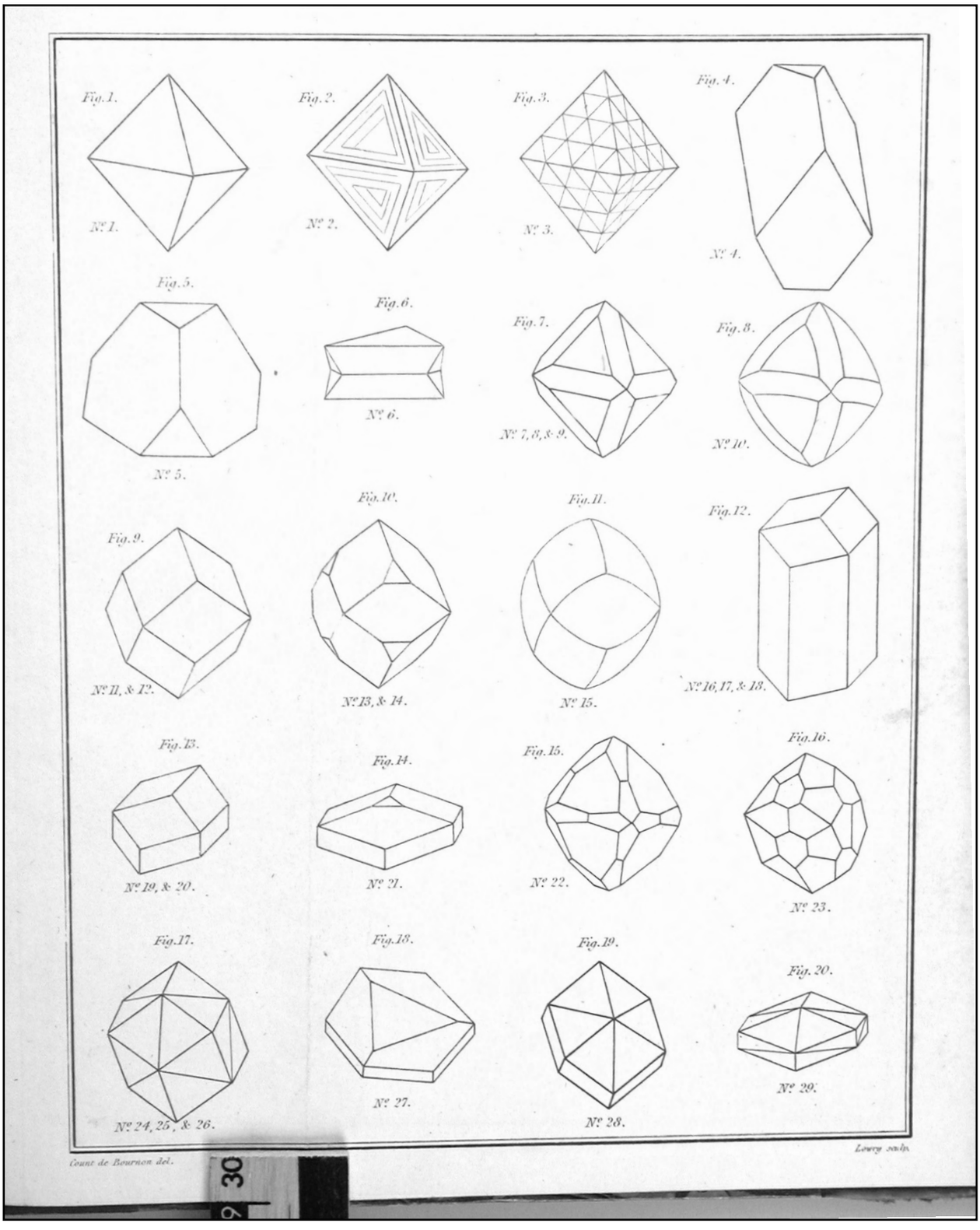


Figure 4. A page from the Catalogue.

When matching was complete, the loose diamonds were re-fixed. The empty pegs were cleaned of their black, waxy adhesive and that for each peg kept separate and used to fix the appropriate diamond back. Cleaning was undertaken using wooden sticks and work was carried out under a binocular microscope, thus minimising any risk of scratching the pegs (which would occur if mounted needles had been used). The waxy material was warmed using a waterbath and when melted, the diamond glue and peg pressed together. As the fixing for three quarters of the diamonds had been secure for nearly 200 years, the original method was preferred to using new adhesives thereby retaining the historical integrity of the mounts.

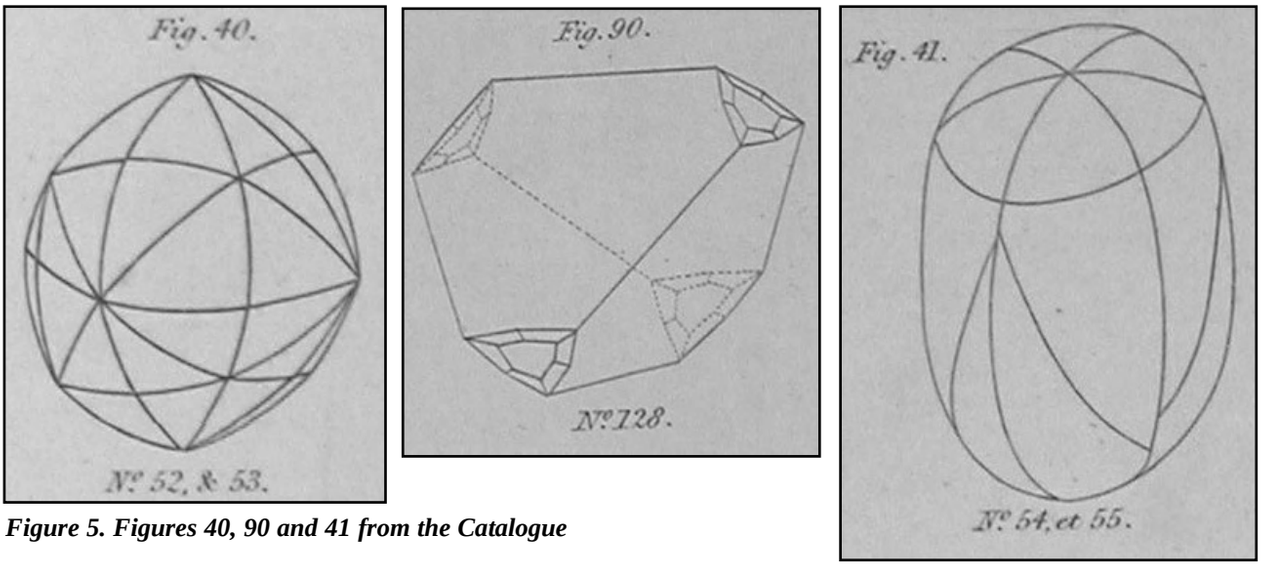


Figure 5. Figures 40, 90 and 41 from the Catalogue

Additionally, a register was made of all the diamonds in the Collection describing them in modern terms, in a more thorough way than previously and relating this to the properties mentioned in the catalogue as well. Should any come loose in the future it should be much easier to assign them to their correct pegs than it was to solve the problem described. In addition, the collection has been re assessed to show its present, considerable gemmological interest and a summary of some of the points of interest in the crystallography, colour variation and inclusions noticed now follows.

Diamond crystals display a wide a variety of different forms and habits. The five plates accompanying the "Descriptive Catalogue " illustrate beautifully the bewildering complexity of the diamond forms displayed in the Hume Collection. In drawing these faithfully de Bournon was undoubtedly able to make accurate interfacial angle measurements using Wollaston's newly invented reflecting goniometer. He recorded angles for 32 diamonds. This would have been difficult for many specimens due to the small size of the crystal modifications and the fact (still not understood) that diamond crystals tend to have notably curved faced - to the extent that some polyfacial examples are virtually spherical (e.g. fig. 11, a dodecahedron, and fig. 40, a 48 faced hexakis octahedron) (Figure 5).

Professor Miller studied the Hume Collection and it is his copy of the Diamond Catalogue that we have today. At the time few native crystals of diamond were available for study; the Catalogue notes that they went straight into the hands of Portuguese and Dutch cutters. This supports a Brazilian source of the stones. Several decades were to elapse before Miller's "Treatise on Crystallography ," (1839), using Whewell's notation enabled the complex crystal faces to be described in a satisfactory manner. So Bournon was restricted to categorizing crystals simply in terms of cubes (1), tetrahedra (1), octahedra (21), rhombic dodecahedra (44) and combinations such as cuboctahedra (30) and grooved octahedral (25). There were 5 spherical and 14 macles (octahedral twins in a triangular shape).

Bournon did however challenge the prevailing view that the "primitive crystal" or molecule of diamond was tetrahedral in symmetry. His contention that diamond was octahedral (in modern terms, the hexocatahedral class of the cubic system) and that apparently tetrahedral diamond crystals (fig. 90 No , 128) were an extreme modification of the octahedron which arose from the "enlargement of four of the faces of the primitive octahedron at the expense of the other four" rumbled on through the 19th Century and was only resolved a century later, in Bournon's favour by W.L. Bragg's first X-ray crystal analysis of diamond in Cambridge in 1913.

Colour variation

Diamond crystals are not all colourless. The recent market for 'fancy' diamonds has created interest in the colours occurring naturally and the impurities or crystal distortions which cause them. The Hume collection contains several colours and tints, some clearly visible, and some difficult to appraise owing to a rough or striated crystal surface.

The colours found are

yellow (obvious/pale)	15, 15
brown	12
black/grey	5
greenish	22

(inclusions give this colour in 15 or more)

No. 139 has an unusual opal colour. Others are described as transparent, white or "of a fine water " (No. 6, page 3 of the catalogue). In several, one part of the crystal is a different colour from the rest, as with No. 55, part brown and part yellow. No. 13 is described as yellow brown, "the colour of fine Malaga wine". The colour variation makes the Collection useful for reference.

Inclusions of interest

The study of inclusions can give clues as to the origin of gems and separate natural and synthetic ones. Many types of diamond inclusions were noted in the Catalogue and they deserve attention now. Diamond 143, the only faceted diamond in the collection is a brilliant cut and was purchased for the obvious inclusion in the table of facet described as "a grain of native gold… Extremely rare. Brazil." Reappraisal indicates that this is a cross shaped, yellow-brown inclusion with black specks, likely to be a protogenic inclusion later replaced by diamond except for a skin of golden-brown iron oxide (Mallett 2006).

In several of the other crystals, there are brown, surface pits with similar structure (seen in Nos. 30, 133, 74 and 122). No. 97 has a rough brown surface. Brown wavy threads or ribbons are found in 91 and 94, and pink/red crystals on one side of No. 55. Many have green specks or thread-shaped inclusions, noted in 15 stones. Otherwise there are numerous black specks in a number of diamonds, generally small and sometimes localized. Obvious inclusions were noted but a microscopic examination not made. Inclusions in diamonds can be of great gemmological and petrological interest as indicators of the great depths at which they are formed, but seriously reduce the value in the commercial, diamond cutting market. (See, for example, Elements magazine, Volume 1, Number 2 for March 2005).

Conclusion

Abraham Hume was a gentleman of means whose wealth enabled him to indulge to the full the fashionable 18th Century pursuit of collecting. Throughout his passion for acquisition however, there always ran a strong scholarly drive towards promoting knowledge and understanding of the natural world through the study of collections. Clearly intrigued by the diamond, he regarded his little cabinet of choice crystals as the outstanding ornament of his collection. How could he ever have conceived that his diamonds had crystallized in the Earth's mantle+ some 3000 million years ago?

Acknowledgements

This work was encouraged and assisted by Steve Laurie who has day to day care of the mineralogical and petrological collections in the Sedgwick Museum. Dr David Norman, Director of the Sedgwick Museum, and Professor Michael Carpenter, Curator of the Mineral Collections gave facilities for the work. Photographs were provided by Ken Harvey. Our sincere thanks go to all of them.

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THE ST. AUBYN MINERAL COLLECTION (c.1794-2010) AT PLYMOUTH CITY MUSEUM AND ART GALLERY

by Jessica Shepherd

Shepherd, J. 2009. The St. Aubyn mineral collection (c.1794-2010) at Plymouth City Museum and Art Gallery. *The Geological Curator* 9 (2): 45 - 56.

Sir John St. Aubyn (1758-1839) was a collector and a facilitator to science and the arts. His particular interest was for mineralogy and this lead him to create a sizeable mineral collection containing many interesting specimens. Some of these have been collected in the field by Sir John St. Aubyn, but most of the specimens have been bought from dealers or as whole collections in auction rooms. We know that St. Aubyn bought a proportion of John Stuart's, 3rd Earl of Bute (1713-1792) mineral collection from Dr. William Babington (1756-1833) in 1799. He also purchased a smaller mineral collection from the son of Richard Greene[1] (1716-1793) in the same year. Richard Greene is an important man to all of us, because he opened the first public museum in England. He was also a good friend of Erasmus Darwin (1731-1802).

Before his death, Sir John St. Aubyn employed Isaiah Deck of Cambridge to auction his mineral collection. In 1834, Isaiah split the collection and gave two smaller collections to Sir John's wife Juliana and to his daughter Mrs. Parnell. Then a larger collection went to the Civil Military Library at Devonport. Luckily parts of the original collection still exist today in Saffron Walden Museum and in Plymouth City Museum. The minerals that are now in Plymouth City Museum and Art Gallery (PCMAG) came to the museum in 1924, on a permanent loan from Devonport. In 2007, PCMAG secured a grant from the Esmée Fairbairn Foundation, enabling the museum's natural history department to conduct a variety of work on this historic collection. In the following article, I will recount my journey through time as I removed centuries of dust to reveal a collection of scientific and cultural importance.

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Introduction

Sir John St. Aubyn, 5th Baronet (Figure 1), was born at Golden Square, London on 17 May 1758. Sir John was captivated by science and the arts and was a keen collector. His father (the 4th Baronet) was brought up by Dr. William Borlase[1] (1696 to 1772), a passionate mineral collector and natural scientist (Hartley 1977). The influence of his father's learned interest is likely to have also assisted in creating Sir John's fascination with minerals and the natural world (Figure 2). St. Aubyn succeeded to the baronetcy at the age of fourteen and was a clever and distinguished man. He served as High Sheriff of Cornwall (at the age of 23), and went on to become a Fellow of the Royal Society, Fellow of the Linnean Society, member of Parliament, Fellow of the Society of Antiquarians, Fellow of the Geological Society of London, Fellow of the Society of Arts and Provincial Grandmaster of the Freemasons. The St. Aubyns were also well-known gardeners in their time including the 5th baronet, who amassed a sizeable herbarium during his lifetime (Shepherd 2009).

Sir John was also interested in the arts and collected a huge number of engravings and etchings which were sold at Phillips's Auction Rooms in April 1840. The collection was so vast that the sale lasted for seventeen days (Phillips 1840). Sir John was also an early and constant patron and friend of the painter John Opie, and was a pallbearer at the artist's funeral in April 1807 (Hartley 1977). The remaining few pieces of Sir John St. Aubyn's art collection can now been seen at St. Michael's Mount, Marazion and at Pencarrow House, Bodmin. Pencarrow is the home of the Molesworth-St. Aubyn family, which took its name when Sir John's sister, Catherine, married John Molesworth in 1790.

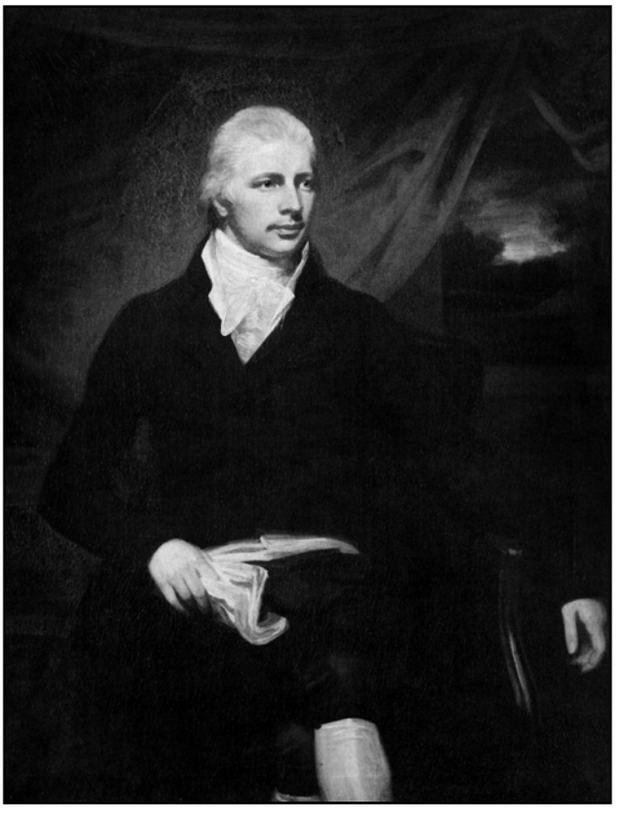


Figure 1. Sir John St. Aubyn (1758-1839), St. Michael's Mount Collection ©

The St. Aubyn family had two estates in Cornwall - Clowance and St. Michael's Mount (Figure 3), which Sir John inherited from his father in 1772. However, it appears that Sir John St. Aubyn found life in this part of the country rather uninspiring for his tastes in fine art and literature, and so he spent more of his time in London, or on estates closer to the city. Towards the end of his life, his family spent a brief time at Shortgrove Hall near Saffron Walden (Pugh 1993; Evans 2009; Searle 1986). The family did not seem to stay there for long, with Sir John auctioning his furniture and livestock in 1835 (Paul and Nash 1835a; 1835b). Sadly, Shortgrove Hall is no longer standing, but the estate is still intact, along with its avenue of lime trees which line the driveway. There is also a small collection of minerals that Sir John donated to Saffron Walden Museum in August 1834.

Figure 2. Sir John St. Aubyn 'The Mineralogist', St. Michael's Mount Collection ©

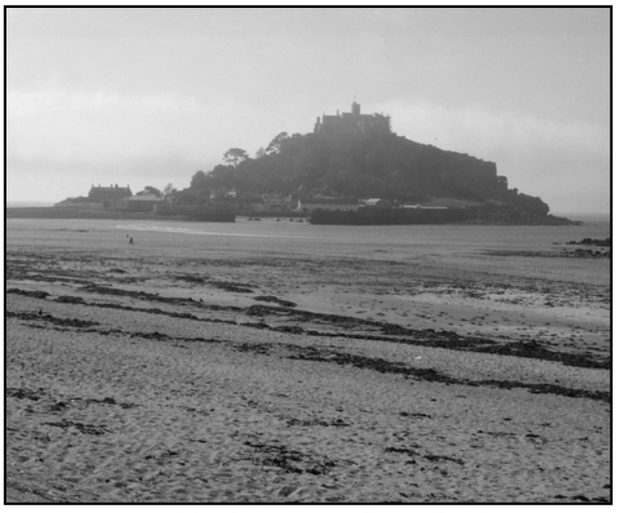


Figure 3. St. Michael's Mount, Plymouth City Museum and Art Gallery ©

Sir John St. Aubyn is said to have spent a lot of time with a number of young ladies in his early years, but the first lady to live with him at Clowance was Martha Nicholls (Hartley 1977; Courtney 2004). Her father, John Nicholls, came from an old Cornish family and was a well known landscape gardener. He was responsible for the grounds at Clowance, which are still very beautiful today. Astonishingly, Sir John St. Aubyn never married Martha, even though she had five of his children. Instead, he married the other lady in his life - Juliana Vinicombe (Figure 4). They met when she was very young and sent her to be educated at Cheltenham. He eventually married Juliana, a blacksmith's daughter, in 1822 when he was 64 (Hartley 1977).

On the 10 August 1839 Sir John St. Aubyn died at Lime Grove, Putney in Surrey at the age of 81. His body was conveyed through Devonport on 23 August, on its way to Cornwall where it lay in state at St. Austell, Truro and Clowance. On 29 August he was buried, with a great ceremony, in the family vault in Crowan parish church (Hartley 1977).

Figure 4. Juliana Vinicombe, St. Michael's Mount Collection ©

History of the collection

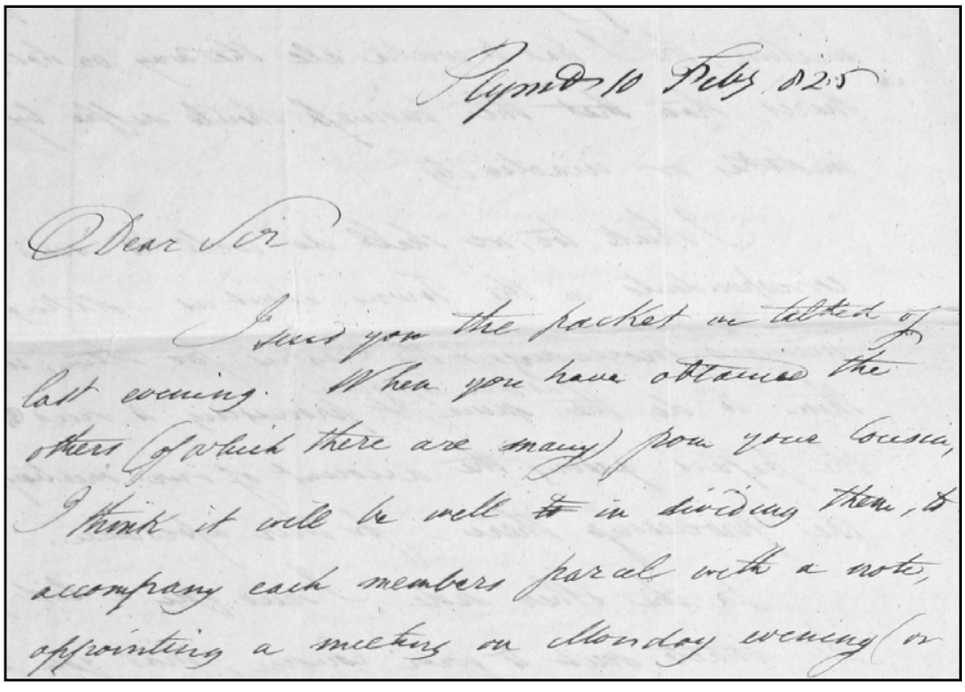
By the time St. Aubyn died, his own estate was deeply in debt, and much of his property had been sold. The marriage portions of 13 of Sir John St. Aubyn's illegitimate children amounted to £130,000, and an Act of Parliament was passed in order to assist the family in the liquidation of Sir John's debts (Saint Aubyn's Estate Act 1847). The practical chemist, mineralogist and mineral dealer Isaiah Deck (1792 to 1853) senior of Cambridge, was commissioned to help dispose of his extensive mineral collection in 1834. Interestingly, Isaiah was also involved in assisting St. Aubyn in auctioning off his belongings at Shortgrove Hall in Essex (Paul and Nash 1835a; 1835b). It is probable that the two men met each other while Sir John was living in that part of the country. Consequently, Deck arranged a small collection for Lady St. Aubyn (Figure 4) and another for Mrs Parnell (his daughter). Sir John then donated a large proportion of minerals to the Civil and Military Library at Devonport (Figure 5) (Cooper 2006). The Devonport collection was later presented to the Mechanics Institute of Devonport in 1876 and subsequently transferred to the Devonport Museum in 1881 (Collins 1880; Hunt 1902). Then in 1924, the St. Aubyn mineral collection was relocated to PCMAG (Plymouth City Council minutes 1924a, 1924b, 1924c).

Figure 5. The Civil and Military Library in Devonport, Plymouth City Museum and Art Gallery ©. It is the closest building on the right and was designed to look like an Egyptian Temple

Between 1834 and 1840, a local chemist called John Prideaux (1797-1859) catalogued and arranged St. Aubyn's minerals at the Civil and Military Library at Devonport. The library occupied a space in the Egyptian Hall in Ker Street (Figure 5). Prideaux was a chemist, and had a shop on East Street in Plymouth. He had an interest in mineralogy and lectured at the Camborne School of Mines (Prideaux 1989). He also was an important figure in the abolition of the slave trade (Moseley 2007; Prideaux 1989; Prideaux 1825). John Prideaux catalogued the St. Aubyn collection by placing them in drawers and labelling the panels inside. His handwriting on the labels is very distinctive and matches the handwriting on a letter he wrote in 1825 (Figure 6). Prideaux used a system which was published by Robert Allan in 1834 (Allan 1834).

Below are some examples of the drawer panels that once contained the St. Aubyn collection (Figure 7). For more than 100 years the St. Aubyn minerals were kept in these cabinets, even during the Second World War, when they were wrapped up in safe storage outside the city (Bishop 1991; K. Loze May 2008 pers. comm.). Unfortunately, some of the cabinets were mistakenly disposed of in the 1980s, and some of the drawers had been broken (Figure 8). It is likely that at the time the true importance of the furniture was not recognised (Barber 1983).

However, Plymouth museum curator, James Barber (1935-1992), salvaged all that he could find as soon as he had seen what had happened, and looked after all the shards of wood in his office until he could find someone to pass them on to. Now, the drawers and their panels are back in the natural history department at PCMAG, and are being very well cared for.



Plymd 10 Feby 1825

Dear Sir

I send you the packet we talked of last evening. When you have obtained the others (of which there are many) from your cousin, I think it will be well to in dividing them, to accompany each members parcel with a note, appointing a meeting on Monday evening (or

Figure 6. Letter written by John Prideaux in 1825, Plymouth and West Devon Record Office © The handwriting on this letter was used to find out if Prideaux wrote the drawer labels

Figure 7. The remnants of a Drawer Panel, Plymouth City Museum and Art Gallery ©

At the start of this project I knew that I had the overwhelming task of matching up the drawer panels to make complete drawers, and then matching the drawers to the specimens. The most difficult part of the task is that many of the labels have themselves been ripped in two horizontally because a batten used to run along the base of each panel. Only recently have I been able to match nearly every single panel; however it is evident that many are missing. It is also apparent that many of the original Devonport minerals are missing, and sadly it is possible that they had the same fate as the drawers. Mike Bishop carried out a great deal of work on the collection for his museum studies qualification in 1991, and he estimated that the percentage loss of minerals from orders 1-10 was 45%. We cannot tell the percentage loss from orders 12-19 because the catalogue listing this part of the collection is missing.

The St. Aubyn Project

Helen Fothergill, Kelly Chevin and Jan Freedman at PCMAG started writing their applications to fund this project in 2005, and secured a grant from the Esmée Fairbairn Foundation two years later. The natural history department chose the Esmée Fairbairn Foundation as they prefer to support projects that are difficult to fund. They also have interests in culture, education and the natural environment.

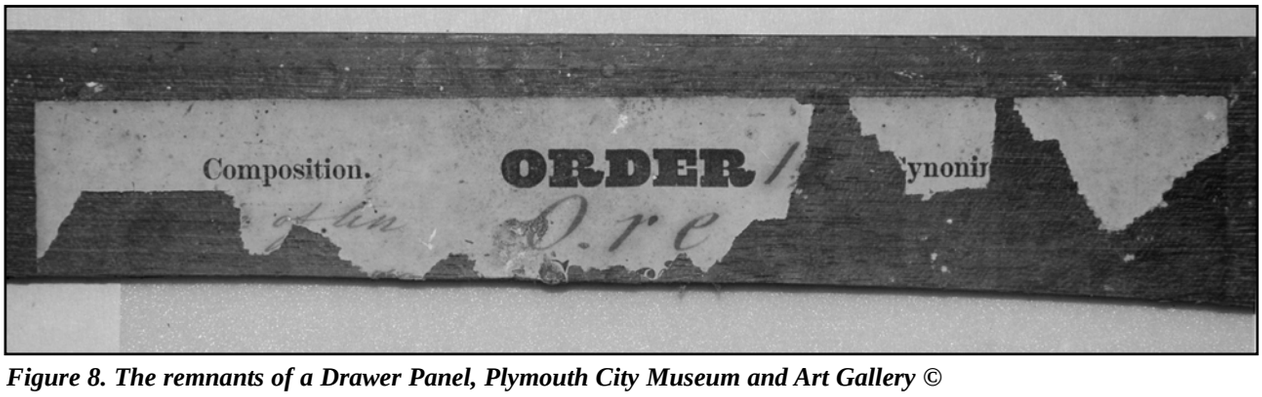


Figure 8. The remnants of a Drawer Panel, Plymouth City Museum and Art Gallery ©

The Mineral Collection

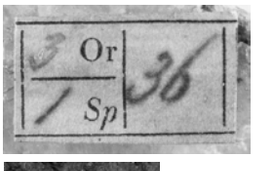
The exact origins of Sir John St. Aubyn's mineral collection is unknown, but he must have had a substantial collection at least as early as 1794, when he met and employed Count Jacques Louis de Bournon[2] (1751 to 1825), to order his collection (de Bournon 1815; Cooper 2006). Count de Bournon is among the most famous mineral collectors and mineralogists of the late 18th century. It was de Bournon's father who had a large mineral collection that stimulated his early and lasting interest in the science. In 1789, the long period of political and social upheaval began, and brought with it radical change both to France and to de Bournon's life. To de Bournon and his family, the French Revolution was a disaster - they lost everything. With the risk of execution becoming more of a reality with each passing day, he had to escape France. A decision was made to move to England, and he crossed the Channel with his family in 1794.

Between the years of 1794 and 1815 under the persuasion of Dr. Babington, de Bournon was employed by St. Aubyn. He was to curate and catalogue his mineral collection. In order to carry out his work, the minerals were kept in London alongside the collections of Sir Abraham Hume[1] (1749-1838) and Sir Charles Greville[1] (1749-1809), which de Bournon was also employed to work on (Lewis and Knell 2009). De Bournon must have welcomed this employment after all that he had experienced in France. Unfortunately, de Bournon never completed the catalogue, as Sir John moved his collection back to Cornwall. He eventually returned to France after the restoration of the monarchy, and became the director general of the mineralogical cabinet of Louis XVIII.

Sir John St. Aubyn spent a lot of time with other famous mineralogists of the day. From 1783 he became a close friend of Rudolph Erich Raspe[1] (1737-1794), who was employed by Matthew

Table 1. Labels present on the St. Aubyn mineral collection (not to scale)
[*If you have any further information about these labels, please contact the author*]

***This label is present on approximately five specimens in the St. Aubyn collection. This label has also been seen it in the Glen collection at Kelvingrove Museum (acc. no**'s. 1896.65 ARS and 1896.65 BFE) and in the William Hunter[1] (1718-1783) collection at the Hunterian Museum.*



This label was put on the minerals that went to Devonport museum only, because they match the drawer panel labels and were written by John Prideaux in c1834.

***PCMAG have two specimens with this type of label on; its origin is still unknown. However, this type of label has also been seen in the Glen collection at Kelvin**grove Museum (Acc. No. 1896-65 BEX) and in the Hunt collection at the Hunterian Museum.*

***PCMAG have a few specimens with this type of label on them, but we are unsure as to where it comes from. It has also been seen in the Glen collection at Kelvingrove** Museum (Acc No. 1896.65 OZ)*

There is only one mineral with this type of label, a specimen of kyanite. It is possible it is a Butean label because it matches the entry in the Babington Catalogue. However, the descriptions are so vague that it needs further research.

Most of the metallic specimens have this label on. This label is designed just like the Count de Bournon's, but the number is not written in his hand. This label could have been written by William Babington or by an assistant to de Bournon.

Most of the specimens in the PCMAG collection have this label on them. They are very similar to the previous label, only these have de Bournon's unmistakable handwriting on them.

This label was applied by Mr. Elliot Steele while the collection was in Free Public Library in Devonport. In 1896, Mr. Elliot Steele was appointed from the British Museum to select and arrange 900 minerals for display (Hunt 1902; Bishop 1991), and it is only these minerals which have this label on.

Boulton[1] (1728-1809) and James Watt[1] (1736-1819) to keep an eye on mining activities in Cornwall (Carswell 1950). We also know that St. Aubyn bought a proportion of the 3rd Earl of Bute's mineral collection from Dr. William Babington in 1799 for £3,000 (Deck 1834) (Figure 10). He also purchased a smaller mineral collection from Thomas Webb Greene (1763-1842), the son of Richard Greene, in the same year for £100 (Torrens 1974). Sir John St. Aubyn's ability to network and communicate ideas is very well represented by the diverse array of labels in his mineral collection (table 1). He obviously was in connection with many dealers during his lifetime. However, surprisingly there are no records of Sir John ever being in correspondence with the Cornish collector Phillip Rashleigh[1] (1729-1811), and they don't appear to have ever exchanged minerals. I personally have the impression that perhaps the two men did not get along well with each other.

The Micromount Collection

Along with all of the minerals, PCMAG has approximately 300 micromount specimens (Figure 9). Most of these consist of a small wooden cup (3.5cm diameter) and a wax column in the middle with a specimen of gem gravel on the top. They are very unusual and extremely delicate. I even noticed a few months ago that you could see fingerprints in the wax from when they were made all those years ago. Sadly, the documentation alongside these specimens if rather limited, and there is only a quote dating back to 1880 when the prolific mining engineer, mineralogist and geologist Joseph Collins (1841-1916) visited Devonport Museum:

> "On a recent visit to Devonport I made a hasty examination of the contents of some of the drawers. The specimens all seem to have been originally labeled in the most careful manner, but the labels, as might be expected, require much renovation; the numerous mounted crystals are mostly fallen from their stands, and the whole collection has a most forlorn appearance, after so many years of neglect" (Colllins 1880).

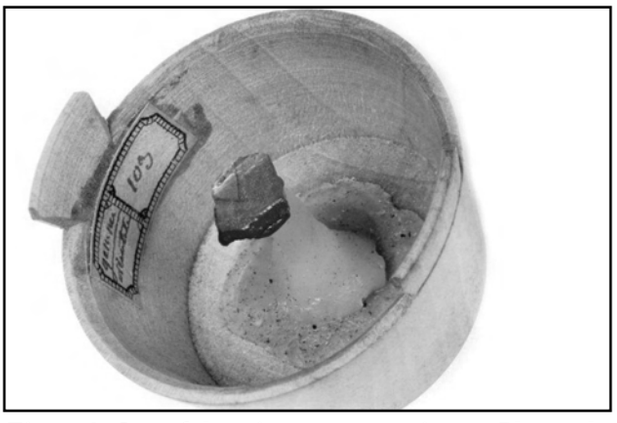


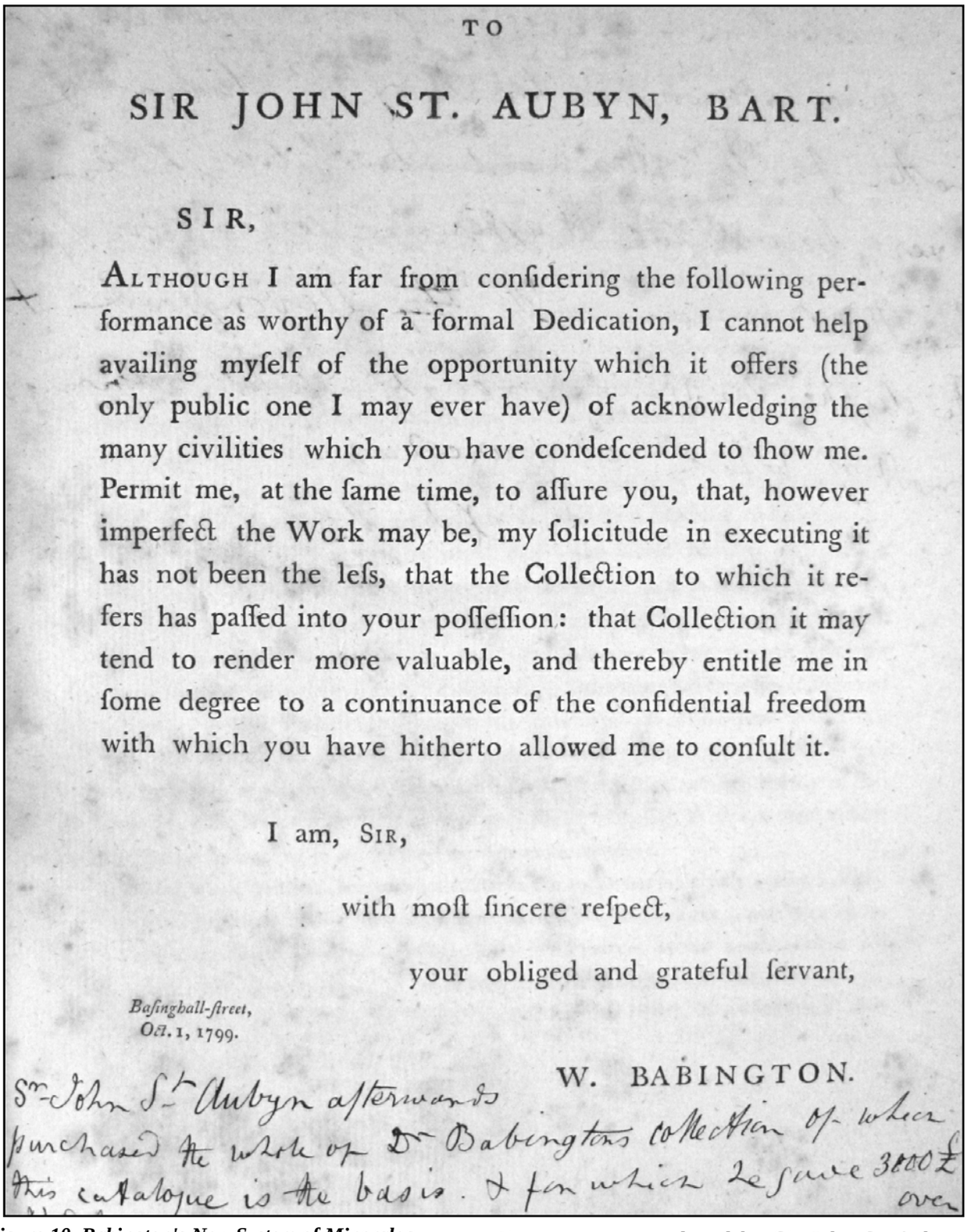
Figure 9. One of the micromount specimens, Plymouth City Museum and Art Gallery ©. If you look really closely you can see finger prints in the wax columns…

Joseph Collins himself was a very important gentleman. Over his lifetime he contributed to the development of mines and china clay operations on both a local and international scale, and was a founding member of the Mineralogical Society. Collins also published numerous scientific papers and books, and unfortunately as Collins described, the micromounts were in the most forlorn of states. Now, only 122 still have their original gems on the top, they are however, still remarkable. Only a few weeks into the project I discovered that Count Jacques Louis de Bournon was making little models out of wood whilst working for Greville, Hume and St. Aubyn (de Bournon 1813). It was then when I began to formulate my theories behind who made these tiny wooden cups. It all seemed so obvious to me, it was after all de Bournon who had such an unfathomable interest in crystalline structures. However, my hypothesis about de Bournon being behind the making of these little micromounts did not really gain a solid grounding until I visited Sedgwick Museum. Whilst there, Steve Laurie kindly showed me Abraham Hume's diamond collection, and under the lid of a great big box lay several black ebony columns with little diamonds on the top. Although not made from the same material, the columns were the same shape as St. Aubyn's. One can still only assume that de Bournon was behind the creation of Sir John St. Aubyn's micromount collection, but if he was, then he almost certainly did Sir John's first as a trial run because these micromounts are not as nearly as fine as Sir Abraham Hume's.

Mineral Catalogues

Alongside Sir John St. Aubyn's mineral collection, PCMAG also holds several catalogues that relate to the collection. Some of these catalogues have been typed and others been hand written, but each one has been compiled during a different time in the collections' history.

In 1799, Dr. William Babington published a catalogue titled 'A New System of Mineralogy' (Figure 10). The catalogue, written using Baron Born's Lavoisierian principles of new chemistry, described approximately 2,000 British and foreign minerals that made up Babington's collection (Babington 1799). The catalogue is important because it describes the minerals that Sir John bought from



TO

SIR JOHN ST. AUBYN, BART.

SIR,

ALTHOUGH I am far from conſidering the following performance as worthy of a formal Dedication, I cannot help availing myſelf of the opportunity which it offers (the only public one I may ever have) of acknowledging the many civilities which you have condeſcended to ſhow me. Permit me, at the ſame time, to aſſure you, that, however imperfect the Work may be, my ſolicitude in executing it has not been the leſs, that the Collection to which it refers has paſſed into your poſſeſſion: that Collection it may tend to render more valuable, and thereby entitle me in ſome degree to a continuance of the confidential freedom with which you have hitherto allowed me to conſult it.

I am, SIR,

with moſt ſincere reſpect,

your obliged and grateful ſervant,

Baſinghall-ſtreet,
Oct. 1, 1799.

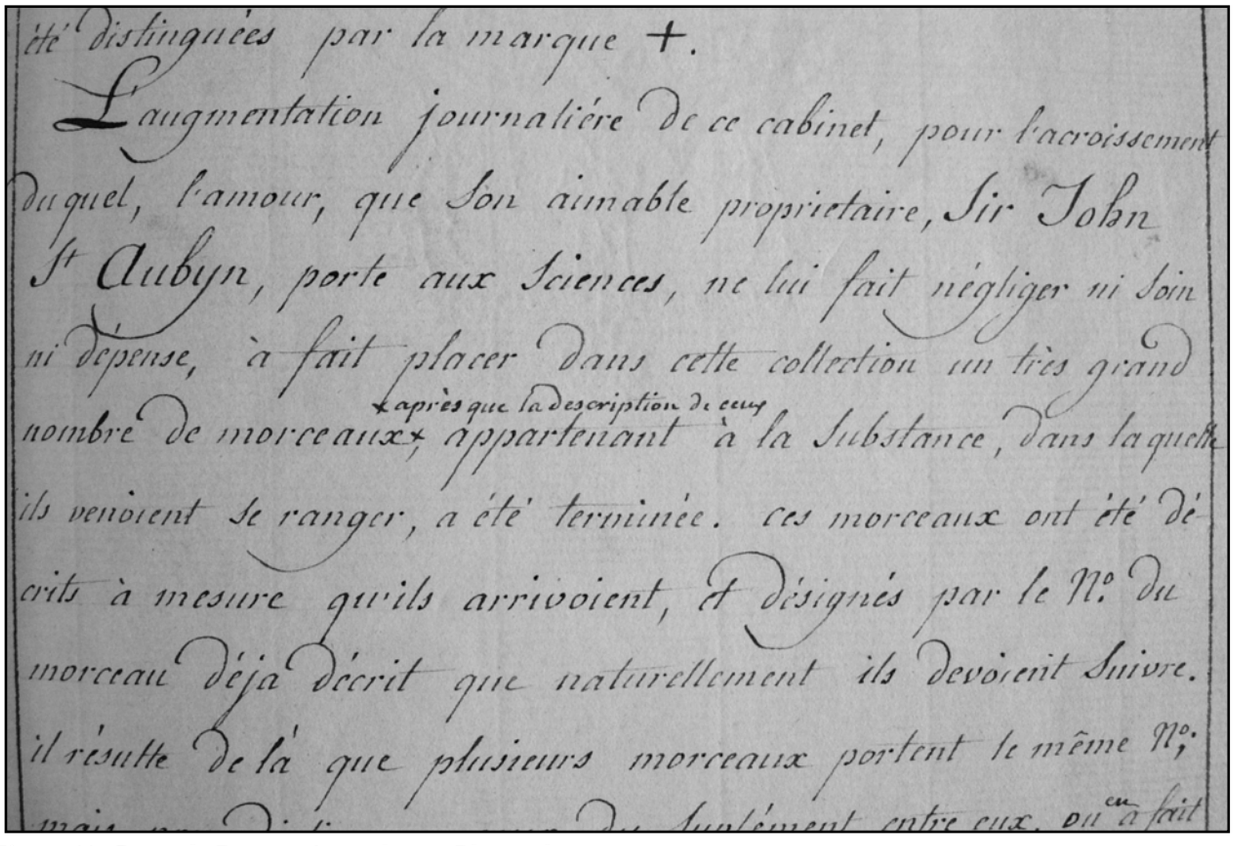
W. BABINGTON.

Sr John St Aubyn afterwards purchased the whole of Dr Babingtons collection of which this catalogue is the basis. & for which he gave 3000 £ over

Figure 10. Babington's New System of Mineralogy, Plymouth City Museum and Art Gallery ©. On the front page of this catalogue there is a wonderful piece about Sir John, possibly suggesting that he funded the publication of this book.

Babington in 1799, most of which had previously been owned by the 3rd Earl of Bute.

Between 1794 and 1815 the expatriate from the French Revolution, Count Jacques Louis de Bournon, was employed by Sir John St. Aubyn to curate and catalogue his mineral collection. Bournon's arrangement follows closely with the theories of crystal structure advocated by the Abbé Haüy and, unlike Babington's classification; Bournon's catalogue is not structured on orders, genera and species. Instead, there is a general subdivision which is in the form of different codes and symbols on the specimen labels. Unfortunately, de Bournon never completed his catalogue because Sir John moved his collection back to Cornwall in 1806


été distinguées par la marque +.

L'augmentation journalière de ce cabinet, pour l'accroissement duquel, l'amour, que Son aimable proprietaire, Sir John St Aubyn, porte aux Sciences, ne lui fait négliger ni soin ni dépense, à fait placer dans cette collection un très grand nombre de morceaux* appartenant à la Substance, dans laquelle ils venoient se ranger, a été terminée. ces morceaux ont été décrits à mesure qu'ils arrivoient, et désignés par le N°. du morceau déja décrit que naturellement ils devoient suivre. il résulte de là que plusieurs morceaux portent le même N°;

*après que la description de ceux

Figure 11. Count de Bournon's catalogue, Plymouth City Museum and Art Gallery ©. This is one page of many, which was written in French between 1794 and 1815.

to 1807. We also believe that there is a catalogue missing, because Collins describes there being three bound catalogues in French (Collins 1880). If this is the case, then volume one is missing, which ran to 220 pages, and described 606 specimens of witherite, barytes, strontianite and quartz (Collins 1880; Bishop 1991).

PCMAG also has three catalogues written in English. One of these is very large and has pre-printed headings 'Order, Species, and Case'. It has 'J Whatman 1840' watermarked paper and covers Allan's orders 1-11, so the second volume is missing. The writing inside this catalogue is written with a blue pen and is not Prideaux's hand. Alongside this catalogue is an index list of mineral names written in another hand in black ink. The book also has a stamp in it indicating that it was bought from Thompson's Commercial Stationers at 23, Old Town Street in Plymouth. This part of Plymouth was severely bombed in the war, and so this book is likely to pre-date 1940. This index also only covers orders 1-11. Lastly, we also have Steele's List of Devonport Minerals, written in pencil and pen, and a number of loose pieces of paper covering the many audits over the years.

Translating the Count de Bournon Catalogue

In recent years, there has been some ambiguity with de Bournon's catalogues because both volumes have been written in French. This has made it very difficult for the natural history department to understand how the catalogue relates to St. Aubyn's collection. At the start of 2008, Helen Fothergill at PCMAG started to make enquiries to find someone who could translate our two volumes of de Bournon's catalogue (Figure 11). We all knew that this would be a difficult task because the natural history department had

Figure 12. Flint, with a blue Count de Bournon label, Plymouth City Museum and Art Gallery ©

previously shown the books to French students and they all remarked on the complicated and dated use of the language. Helen knew that we couldn't just get any French translator to do the job; we needed someone extraordinary… and then came along Margaret Morgan from the Royal Cornwall Museum in Truro. Margaret is the documentation officer at Truro and was involved in cataloguing the Philip Rashleigh collection. Along with her knowledge in 18th century mineralogy, she also studies old languages, including French. In April 2008, Helen and I passed our two volumes to Margaret who started her translating straight away. We agreed that Margaret was to send a section monthly so that the translated extracts could begin to be matched to the collection.

Now over a year has passed and PCMAG have two new files on our selves of translated material. PCMAG also have many minerals which have been reunited with their old descriptions. Margaret was also able to unveil the mystery behind our triangular labels. They are only on a few specimens, but it was discovered that Count de Bournon used them as pointers to show something of interest on the specimen (Figure 12). Unfortunately, none of the minerals at PCMAG have been matched with these blue, red and gold labels to an entry in the two remaining catalogues. However, below are a couple of translated quotes where he describes the action of placing these distinctive labels on some of the specimens.

> "*J'ai indiqué, par un petit morceau de papier bleu, un octaèdre très alongè de la pyrite blanche arsènicale, dont ce morceau cenferme plusieurs octaèdres parfaits*".
>
> "I have indicated, by a small piece of blue paper, a very elongated octahedron of the white arsenical pyrites, of which this piece contains several perfect octahedrons" (De Bournon 1815, pp.388).

> "*J'ai indiqué, par un petit morceau papier rouge, une petite cavité dans la quelle on peut observer quelques cristaux de ce Spath pésant, recouverts en entier par de petits cristaux de Spath pésant, Sulfurique, et par qualques cristaux de Spath perlé d'un jaune brun*".
>
> "I have indicated by a small piece of red paper a small cavity in which one can see some crystals of this heavy spar, completely covered by small crystals of sulphuric heavy spar and by some crystals of brown yellow pearl spar" (De Bournon,1815, pp.16).

Through the translation a number of interesting essays hidden within the catalogue have been discovered. These essays are historically important because they were never published and they present the ideas that de Bournon had about geology almost 200 years ago.

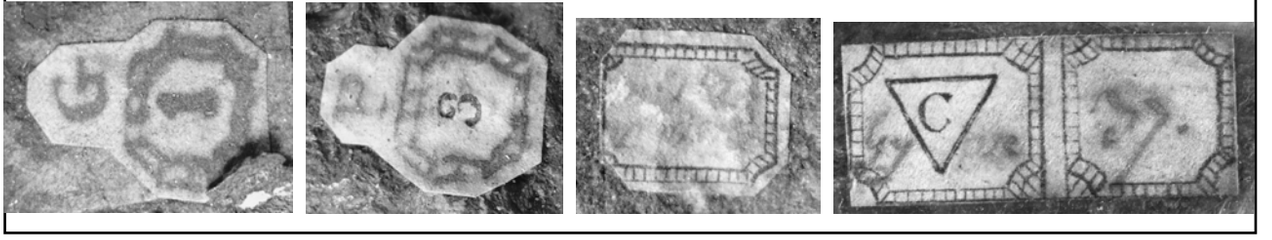
Finding the Missing Minerals

Sir John St. Aubyn's mineral collection is a fine example of a dispersed collection and it was our mission to see if we could find any other St. Aubyn minerals that would have been part of the original collection before Isaiah Deck split it. To begin with, this was tackled this by trying to promote the project in as many geologically-themed journals as possible. Individual museums and societies which I knew had a link to St. Aubyn or his contemporaries where then contacted. This research has been extremely fruitful, and 62 minerals have been located. Images of all these minerals will be put into the PCMAG database so that the minerals are reunited online. However, we feel that there are a lot more minerals out there and many of us realise that some collectors and dealers are worried about sharing information with us. Therefore, I would like to take this opportunity to reassure anyone who has a St. Aubyn mineral that we would only want a photograph of the specimen and your name won't be published or made public.

Sedgwick Museum

As the project progressed into the summer months, Helen and I went on a trip to the east, and part of this trip involved us visiting the stores of the Sedgwick

Table 2. The evolution of the Count de Bournon label (not to scale) from left to right. First three labels Sedgwick Museum ©, last label Plymouth City Museum and Art Gallery ©



Museum in Cambridge. I wanted to see the minerals there, including Sir Abraham Hume's minerals, because there was still a lot of confusion about the labels on the St. Aubyn collection. We were not entirely sure that the labels with the hatched borders were de Bournon's. I felt that Sedgwick Museum could give the answer, because if the labels on Hume's collection were the same as the ones on the St. Aubyn collection, we could be more confident that they are de Bournon's, because he catalogued both collections. It seemed the best option to me at the time.

However, what Helen and I found was not what we expected. We found a series of labels; some of which bore no similarities to the St. Aubyn collection, but others had a resemblance. Unusually, you could see the evolution of the de Bournon label on Abraham Hume's minerals (Table 2). Sadly, we still cannot say with confidence that all these labels are the product of de Bournon's design, as there are two sets of handwriting on the St. Aubyn minerals. However, the only recognisable handwriting on Hume's minerals was de Bournon's. Lastly, I feel that it is important to mention the fantastic catalogues which are kept at Sedgwick Museum. They have five complete catalogues written by the Comte de Bournon for Sir Abraham Hume, which include illustrations of crystal structures and are written in both French and English.

Tripe specimen

A lovely little story which deserves a mention is about a piece of Haytorite in the Arthur Russell collection at the Natural History Museum. The labels suggest that it was originally in the St. Aubyn collection and was in Devonport Museums before Arthur Russell obtained it. However, the most delightful thing is a small piece of tatty paper which sits with the specimen. It reads:

> "Haytorite. Presented by Mr. Tripe"

I had no idea who Mr. Tripe was at the time, but a year after I saw that specimen, our Maritime Officer Nigel Overton, gave a wonderful lecture about the Tripe family of Devonport. It is thought that this mineral was given to Sir John St. Aubyn by Cornelius Tripe (1785-1860), a surgeon and the Mayor of Devonport. Cornelius had a large family, and was so interested in natural science that he called one of his sons Linnaeus Tripe[1] (1752-1821). Linnaeus was a British photographer, best known for his photographs of India and Burma taken in the 1850s.

Conservation and Documentation

Work on the mineral collection began in January 2008, where I began to move all the St. Aubyn minerals from the main geology drawers to their own cupboards. This made working on the collection much easier. It also allowed me to pack the minerals in their own microchambers, thus helping with their preservation. I used a Gratnell rack of drawers and transparent boxes with nests of acid free tissue paper, to safely store the minerals.

In March 2008, the documentation department began work on digitally photographing the entire St. Aubyn collection. This should have been straight forward, but several St. Aubyn minerals were on tour or on display, so photography took longer than first expected. After all the images were taken, conservation work could commence, and so far our conservator has surveyed the condition of half the collection. Cleaning has not yet begun because we are currently completing all the relevant COSHH and risk assessment forms.

In 2008, the conservation department also got to work on the Devonport drawers to see if they could remove the labels. It was hoped that this would solve the storage problems of housing 40 empty drawers and numerous panels. Unfortunately, a humidifier didn't work, so we tried a material called sympatex. This worked at first, but after a few panels, this method proved unsuccessful. The labels must have been put on the drawers when the varnish was still wet. Several months on, we have now conserved 10 drawers and have decided to keep all the furniture, because it does tell a great story. Added to this, I found out that in the Museum National d'Histoire Naturelle, the furniture containing the Count de Bournon's mineral collection is classified a national treasure, but the minerals inside are not (Farges 2008)!

Along with all the conservation work, the staff and volunteers at PCMAG have spent a lot of time on updating the database. This has involved attaching images and updating the records so that the de Bournon catalogue entries are now finally alongside the relevant specimen. After several months, the micromount collection is now available online: www.plymouth.gov.uk/staubynmicromounts. The mineral collection will be launched by November 2009 (www.plymouth.gov.uk/staubynminerals). Lastly, if anyone is interested in seeing the collection, we will be touring a small exhibition across Great Britain, from January 2010.

Conclusions

This project has demonstrated how important it is to undertake research on natural history collections. Without this, such collections are of no value to the general public or research-based societies. By advertising and promoting the project, I have been able to highlight the presence of the collection, which in turn has attracted a lot of attention from other institutions. I think it is vital for museums to endeavor to bring collections to life. But usually of course, it is a funding-related issue that stops departments from spending more time getting to know their collections.

Sadly, it has become increasingly difficult to find funding for projects that may not reap results and therefore more and more places are applying for money for building projects, or for purchasing new acquisitions instead of spending money on finding out the true story behind the collections that they already own. I think PCMAG were really lucky to get the grant from the Esmée Fairbairn Foundation, as they uniquely give money to projects that may not reap all the results originally hoped for. I think such optimism in a funding body is rare, but it does show that a little bit of faith can go a long way.

Acknowledgements

Plymouth City Museum and Art Gallery would firstly like to thank the Esmée Fairbairn Foundation and Renaissance South West for funding the St. Aubyn Project for two years. We would also like to thank everyone who has contacted us with information about the collection, especially the private collectors, and all our volunteers: Tony Coe, Jack Dann, Martin Ellam, Aaron Gallimore, Bill Mason, Bea Wilson and Yuki Yoshioka who have helped us with our documentation and conservation. Naturally we are indebted to the St. Aubyn family and staff at St. Michael's Mount who have allowed us to take photographs of the family portraits, Kelvingrove Museum for allowing us to spend three days rummaging in their stores, Sedgwick Museum for showing us their Abraham Hume collection, The Natural History Museum for sharing all of their knowledge and helping me when I reached a dead end, Museum National d'Histoire Naturelle, the William Salt Library, Pencarrow House, The Royal Cornwall Museum, The Hunterian Museum and Saffron Walden Museum. I would also like to thank Hugh Torrens for all his help and input, and for helping me with this publication. Lastly, I would like to thank Plymouth City Museum and Art Gallery for giving me this incredible opportunity to work with the St. Aubyn collection, it's been great!

www.plymouth.gov.uk/museumstaubynminerals/

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WILLIAM HELLIER BAILY (1819-1888): FOREVER AN ACTING PALAEONTOLOGIST WITH THE GEOLOGICAL SURVEY OF IRELAND

by P.N. Wyse Jackson and M.A. Parkes

Wyse Jackson, P.N. and Parkes, M.A. 2009. William Hellier Baily (1819-1888): forever an Acting Palaeontologist with the Geological Survey of Ireland. *The Geological Curator* 9 (2): 57 - 84.

Bristol-born William Hellier Baily (1819-1888) was an accomplished artist and lithographer, who spent all of his adult life employed by the Geological Survey, first in London and then from 1857 until his death in Dublin. He was responsible for the identification and curation of thousands of fossil specimens on which he provided reports for the official memoirs that described the mapped geology of Ireland. Appointed as a Senior Geologist to Ireland he was styled 'Acting Palaeontologist' and he waged a long and ultimately unsuccessful campaign to gain promotion to Palaeontologist. He was a regular participant at the annual meetings of the British Association for the Advancement of Science, and published on a wide spectrum of topics in palaeontology.

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Introduction

By the mid-1840s it had become clear to men of science that systematic study of fossils was of fundamental importance in deciphering the geological message revealed in successions. From the outset of the Geological Survey of Ireland's (GSI) mapping of the country in 1845, the importance of collecting fossils to correlate the strata and assign ages to the various formations was recognised as critical, and staff to support such endeavours were appointed. The staff of the fledgling organization included two fossil collectors and also Frederick M'Coy who was appointed an Assistant Geologist. He had considerable palaeontological experience despite being only 22 years old, having catalogued the collections of the Geological Society of Dublin (M'Coy 1841) and been in the employ of Richard Griffith (1784-1878), who had produced the first large-scale geological map of Ireland in 1839 (Herries Davies 1983, 1995), M'Coy described the fossil collection now known as the Griffith Collection in two monographs on the Lower Palaeozoic and Carboniferous fossils of Ireland (M'Coy 1844, 1846 (1862)). M'Coy's time in the GSI was not a success and he resigned after only sixteen months (Herries Davies, 1995, p. 315). He later became Professor of Geology at Queen's College, Belfast before moving to Melbourne in Australia where he had a glittering career. The senior Fossil Collector was James Flanagan, who had worked for the Ordnance Survey of Ireland and with Joseph Ellison Portlock in Londonderry, where he helped assemble an important suite of materials (Portlock 1843, Tunnicliff 1980).

The GSI was a branch of the Geological Survey of Great Britain (GSGB) or Geological Survey of the United Kingdom (as it was named at different times), and the Palaeontologist provided determinations of the specimens collected by the field geologists, and advised them on the stratigraphical implications of the finds. First Edwards Forbes (1815-1854), then his successor John William Salter (1820-1869) paid visits to Dublin to examine the collections made during early mapping years.

However, despite the renowned, and even illustrious, palaeontological names associated with the GSI's fossil collection, that of William Hellier Baily (Figure 1) carries an enduring quality and a hallmark of distinction without his having a single volume of the quality of M'Coy's synopses (M'Coy 1844, 1846 (1862)), Portlock's memoir of the geology of Londonderry and adjacent areas (1843) or their English counterparts.

Baily, who served as the Acting Palaeontologist from 1857 until his death in 1888, is the subject of this study. Here we explore facets of his background,

Figure 1. Studio photographic portrait of William Hellier Baily aged 44, 1863 (Courtesy British Geological Survey (GSM 1/639).

character, family life, his scientific work, and in particular his contribution to Irish palaeontology through his publications and curation of the fossil collections in the Geological Survey. We also examine his relationships with some of his colleagues and assess the professional disappointments that he felt he had to endure throughout his time in Ireland.

This paper can be considered to be the latest in the series 'Uncurated Curators' that were a feature of early issues of *The Geological Curator* and its predecessor the *Newsletter of the Geological Curator's Group*.

Baily's ancestry and early life

William Hellier Baily's immediate ancestors are quite difficult to unravel because of the use of very similar names and variants. He is descended from Dr Walter Baily (1529-1592) a physician to Queen Elizabeth I (Ossie Baily, written communication to PNWJ 21st November 1996). Later Bailys hailed from Frome Selwood (now just known as Frome) in Somerset, and some later became active in the commercial life of the seaport of Bristol situated close by.

His great-grandfather was a James Baily who died before 1811, and grandfather was William Hillier Baily (born 1763 Bradford-on-Avon, Wiltshire which is just north of Frome Selwood across the county boundary) who moved to Bristol and became a carver of figureheads for ships [He should not be confused with the man of the same name who was a tea merchant and grocer of 44 Redcliff Street, Bristol (*Pigot's Directory of Gloucestershire 1830*)]. In later obituary notices of his son the sculptor, it was noted that William was one of the foremost exponents of his craft in the country. For a while he was in partnership with a Mr Wolles and the pair occupied a premises on the Quay in Bristol until the partnership was dissolved in 1806 (*London Gazette* 14 July 1813: 1390). He married Martha Hodges in about 1787, and set up home at 1 Red Lodge Court. She was related in some way to Edward Hodges who in the early 1800s constructed some of the Martello Towers around the shores of Britain as a response to the Napoleonic threat. The couple had four children, two sons and two daughters. Their two daughters were Martha (born 19 December 1793) and Mary Ann (born 30 May 1790). Edward Hodges Baily (1788-1867) was their eldest son and he became the premier sculptor of his day in England. He was responsible for the statues of Nelson in Trafalgar Square and Bishop John Jebb in St Mary's Cathedral, Limerick in Ireland, and coincidently also carved a marble bust of Henry De la Beche (see Sharpe and McCartney 1998: 149 and 252) who later gave his artistic nephew William employment with the Geological Survey. His daughter Caroline married his pupil Edgar George Papworth (1809-1866) who became a renowned sculptor in his own right.

William and Martha's second son, John (5 August 1792-31 July 1868) followed his father into the trade as a carver and guilder of figureheads, and in 1830 he was living at 2 Park Place, St Michael's Hill, Bristol. This district of the city, it would appear from *Pigot's Directory of Gloucestershire* (1830), to have been a haven for artisans and craftsmen. Later in life John Baily became a commercial traveller (*The Bar Reports* 1869, p. 278-279). He had at least three children: William Hellier Baily (born in Bristol 7 July 1819, possibly at 2 Park Place), the subject of this paper, and two daughters, Priscilla (born about 1825, died Bath, Avon 1875, aged 50) and Mary Jane (married 1874, Bristol). This is known because on 17 April 1869 a problem with his appointment of executors came before the courts (*The Bar Reports* 1869).

Baily's early forays into scientific work

After his schooling William went to work for a solicitor in Bristol but having developed his artistic skills from an early age, a long-term career in the law was unlikely. In 1837 when aged 18 Baily was taken on as Samuel Stutchbury's (1798-1859) Assistant in the Bristol Institution (Crane 1985) and his scientific career began. Stutchbury may have utilized his young assistant's abilities as a draftsman, although as yet we cannot find any published lithographs or drawings from this period. By the mid-1840s the Institution had begun to be affected by an economic downturn and its poor financial state led to his departure in 1844. Stutchbury was to also leave when in 1850 he moved to New South Wales to take up an appointment as a Government Geological Surveyor (Branagan 1996: 135). He later returned to Bristol where he died in 1859.

Fortunately after leaving the employment of the Bristol Institution Baily quickly found another opening with John Phillips, nephew of William Smith. The De la Beche correspondence in the National Museum of Wales includes letters from Edward Forbes and John Phillips from the mid-1840s which are illuminating. Baily, whilst clearly a junior fellow and subject to direction in his work, was also apparently liked as an individual and trusted to complete work satisfactorily, mainly drawing specimens for publications. Phillips, on 23rd December 1843, sought De la Beche's opinion on the salary of £2/2/0 a week he proposed for 3 months work he was finding Baily starting January 1844. Later, on the 24th August 1844, he finished a letter writing: "In regard to Baily, I have the strongest desire to help him, and if any difficulty should arise in respect of his employment, I should hope to be informed, as some thing may be in my power. If he were not employed on the Survey, I could give him a month's work or more immediately, on my own account, and would gladly do so." (National Museum of Wales (NMW) De la Beche archive 1562).

Later in April 1844 Baily was appointed to the Geological Survey of Great Britain as a draughtsman, and promoted to a museum-based Assistant Geologist in April 1845 on a salary of 9 shillings and seven pence per day (= £149/19/7 per annum) which allowed him avoid paying income tax (GSM 1/7, p. 94). This took him to London where he was to purchase a house, at 18a Walcot Place East, Kennington Road in which he was living in late 1855 just before he moved to Ireland (*London Illustrated News* 1856). In 1854 he was appointed an Assistant Naturalist.

Whatever favours or patronage may have been instrumental in opening doors for Baily into the GSGB, his talents as a draftsman and former Museum Assistant in Bristol were clearly sufficient to establish himself, since later letters from A.C. Ramsay to De la Beche indicate that Baily's salary and income tax was being paid by De la Beche himself in 1850 (e.g. NMW De la Beche archive 1797).

In the Museum of Practical Geology in Jermyn Street that opened in 1851 he continued to produce drawings and engravings on stone for lithographs but he also came under the management of Edward Forbes until he moved to Edinburgh in 1854, and later under Thomas Huxley. No doubt much of his work would have been mundane identification and curatorial work, but this was valuable experience for a future palaeontologist in his own right, and this palaeontological experience was to later be put to great use in Ireland. He would have helped make material available to others for study and in 1848 provided some barnacles for Charles Darwin to study (Darwin to Baily, letter 5th October 1848; letter number 1201, www.darwinproject.ac.uk).

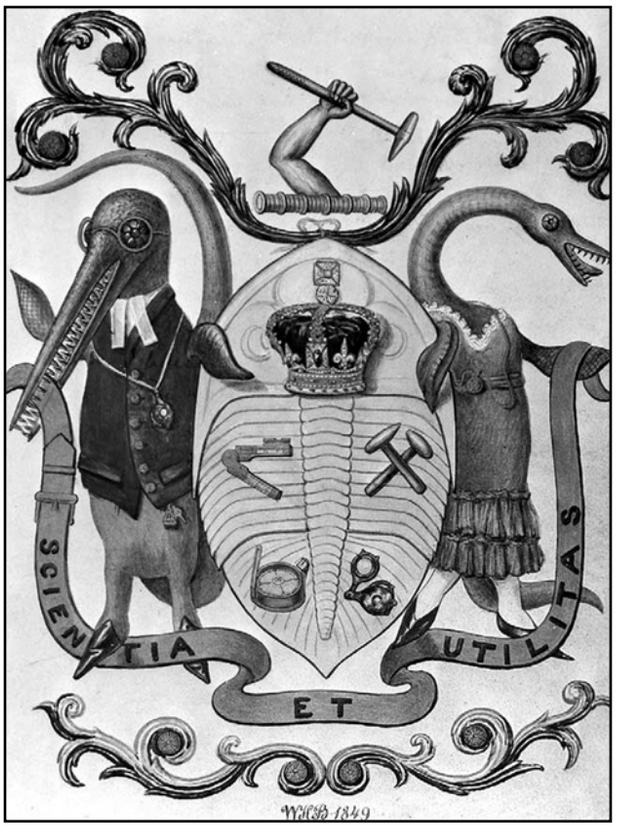


Figure 2. Baily's Coat of Arms for the 'Royal Hammers', 1849 (Courtesy National Museums of Wales).

The following year he produced a crest for the 'Royal Hammers' as the Geological Survey had informally become known. This took the form of a trilobite supported on the left-hand side by a dapper spectacled Mr Ichthyosaur and on the right-hand side by Miss Plesiosaur (Figure 2) (McCartney 1977: 59; Fara 2005; see also Wilson 1985 front cover for a redrafted version). From 1849 the geologists composed verses (or 'songs') which were recited at the Annual Dinners; Baily contributed four such songs: 'Lament of the Irish elk' (1856), 'Ode to the Megatherium' (1856), and 'The Geological Surveyer' (1857) (BGS Archives GSM 1/146), and his first in 1849 which was a description of the crest in slightly turgid poetic verse. Baily himself best describes his artistic creation:

Unto the Royal Hammers
The Banner is unfurled
Above the honored President
Proclaim it to the World

Our Coat of Arms emblazoned forth
In Heraldic display
No longer quiet ought to rest
Another dinner day

Thus quartered here on gules the first
A level we may see
The emblem appertaining to,
Is leveling all degrees.

2nd The hammers crossed you see
And it does well suggest
The motto "aim at a oure end"
As also does the crest

On gules the 3rd a compass is
Prismatic, most approved,
The moral it suggests is good
And have ere now been proved

"Keep within compass" are the words
its prism holds to view
To regulate our actions else
Be sure would never do

The 4th a magnifying glass
Not errors to increase
But beauties rare to bring more near
Unfolded to our face

The Shield, on which these quarterings sketch
Here figured as they stand
Is Asaphus caudatus, of Old Silunas land

The Crest a right arm proper
With hammer strong upheld
Ready to strike with vigour, wherever it's compelled

Supporterd dexter an old Saurian
All spectacled and clothed
Not certainly as he appeared
In wonderous times of old.

The sinister Miss Plesio stands
Although she rather short
Her petticoat and frills were made
By Bone's wondrous art

And now the motto here revealed
In Latin as its stands
Is Scientia et Utilitas
You have it at your hands.

William Hellier Baily, January 1849 (BGS Archives GSM1/146)

By the mid-1850s the young scientist had gained enough experience to be entrusted with some research projects of his own and by 1859 he had published two papers, both in the *Quarterly Journal of the Geological Society* of which Society he was to become a Fellow. The first described some Cretaceous fossils from South Africa (Baily 1855), and the second was on fossils from the Crimea (Figure 3) (Baily 1859). The latter were also the subject of a letter by him published in the *Illustrated London News* in 1856. The Crimean War was waged between 1853 and 1856 and the material about which Baily published, had been brought back to England by General Charles Frederick Cockburn (1830-1908). It is now in the Natural History Museum, London (Cleevely 1983: 46). He was to return to the subject of fossils from the Crimea in a later paper that described the collections in Dublin (Baily 1860).

Baily as an artist and draftsman

Employed initially as a draftsman, Baily together with his colleague Charles Richard Bone produced drawings and the engravings on stone for plates to illustrate the *Figures and descriptions illustrative of British Organic Remains* series which was part of the *Memoirs of the Geological Survey of the United Kingdom* that appeared between 1849 and 1853 (Appendix 2.1). Baily and Bone were skilled draftsmen and undoubtedly their work took a considerable portion of their time.

Apart from his official Survey tasks Baily was in some demand as an artist and he undertook some

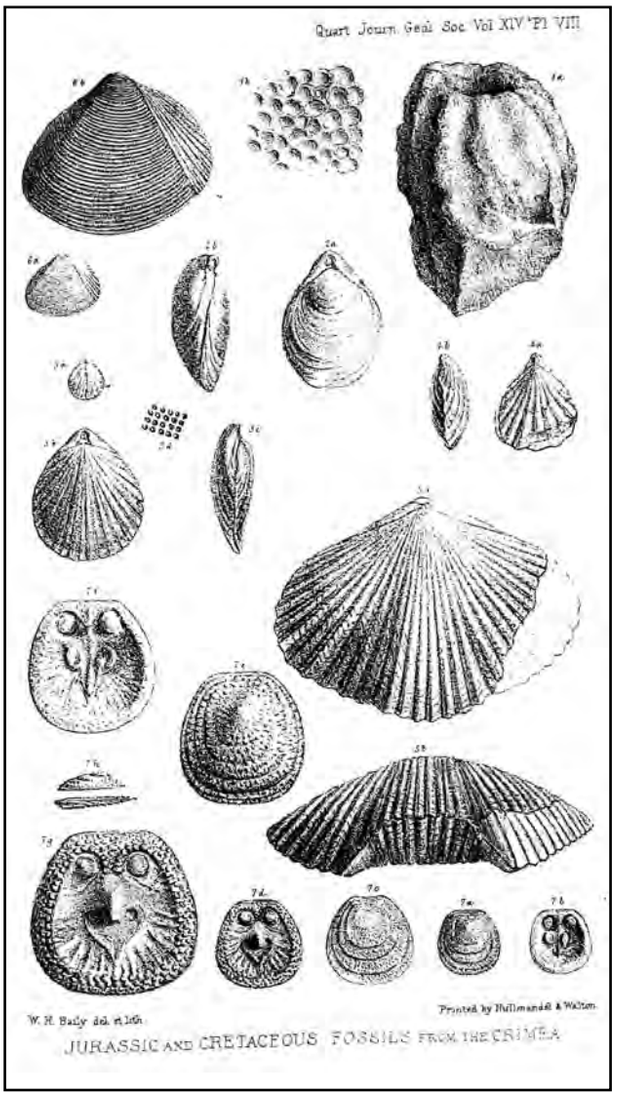


Figure 3. Lithograph by Baily of Mesozoic fossils from the Crimea (Baily 1859).

additional palaeontological commissions while in London. His work appeared in the some important geological and natural history journals and monographs in the early 1850s (see Appendix 2.4). Thomas Wright, a Cheltenham surgeon and natural historian, commissioned him to illustrate fossil echinoids from Britain and Malta that he published on in the *Annals and Magazine of Natural History* in 1855 (Wright 1855; see also Zammit Maempel 2007, p. 40). Similarly he undertook work for Edward Forbes who had him provide six plates of bivalves and echinoids to partially illustrate his major paper on the fossil invertebrates of southern India published in the *Transactions of the Geological Society* (Forbes 1845), and later more plates for his monograph on the naked eye medusae published by the Ray Society (Forbes 1848). Both Forbes and Wright as well as John Morris had him illustrate their monographs published by the Palaeontographical Association (see Appendix 2.3).

Once he arrived in Ireland he continued his artistic work in an official capacity for the Geological Survey which involved often engraving on wood the illustrations for the Memoirs that described the geology illustrated by the one-inch to one mile geological maps (see Parkes *et al*. 2000). He continued to work for others including William King of Galway (1857), a Mr Waller (1860), the Rev. Samuel Haughton (1860), Andrew Leith Adams (1863) and his GSI colleagues, Joseph Beete Jukes (1862, 1863) (Figure 4a, b) and George Henry Kinahan (1878) (Figure 5). For Adams Baily provided illustrations of two new species of the Maltese Pleistocene dormouse *Myoxus*. However, later the author complained that

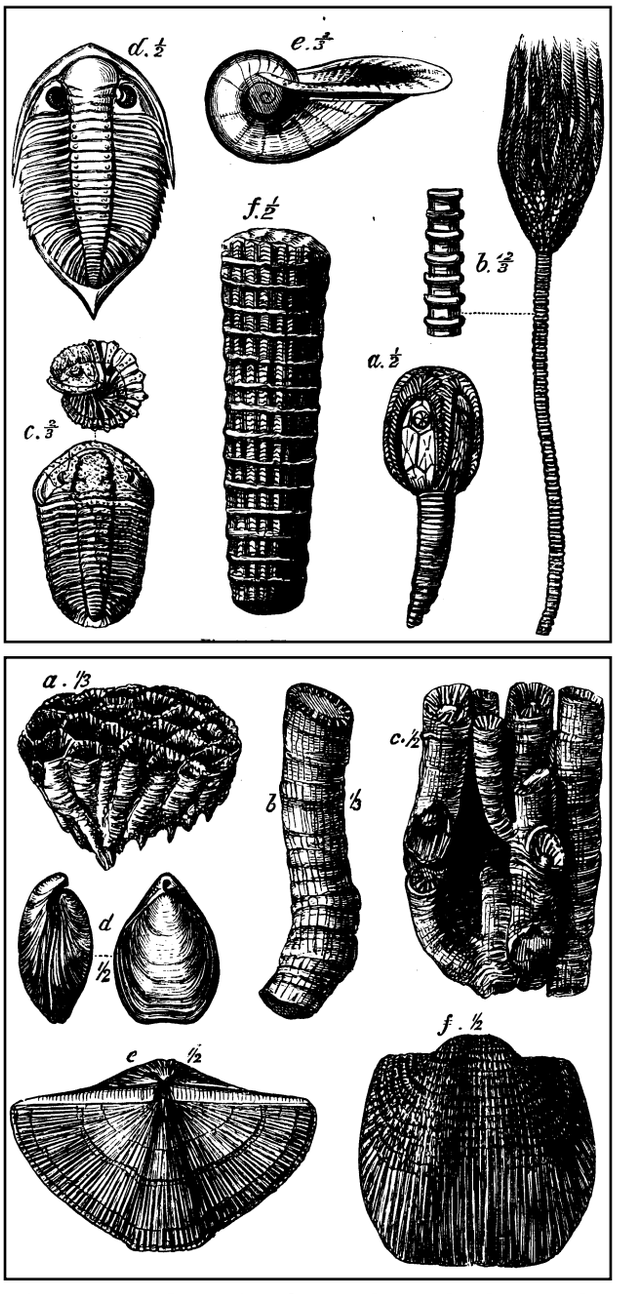


Figure 4. Woodcut prints from Jukes' School Manual of Geology (6th edition, 1892). 4a. Silurian fossils; 4b. Carboniferous fossils.

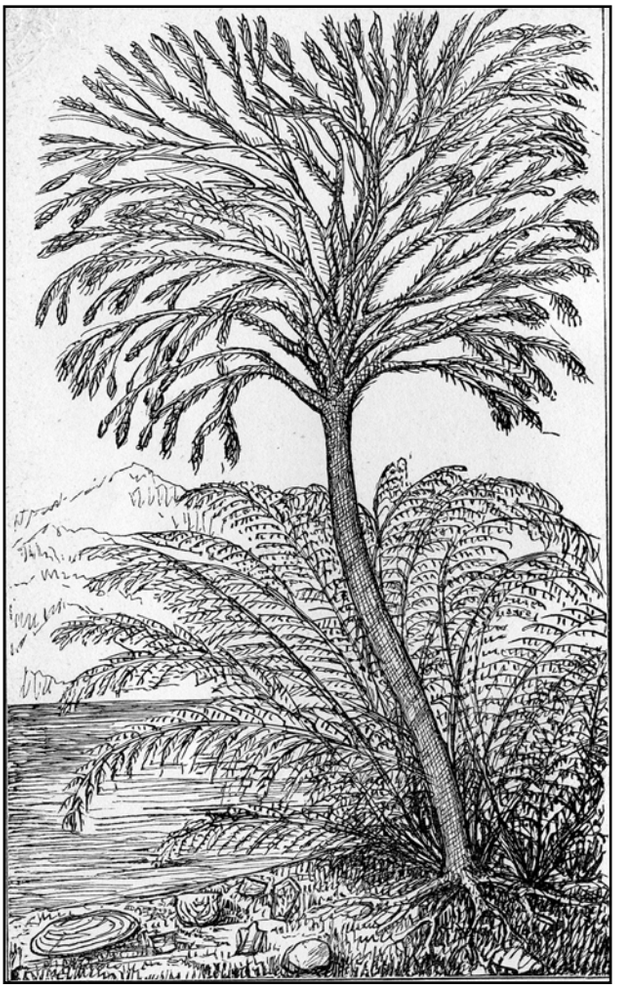


Figure 5. Frontispiece from George Kinahan's Manual of the Geology of Ireland (1878) showing a reconstruction of the fossil assemblage from Kiltorcan, Co. Kilkenny. The fossil plant* Sagenaria bailyana *is the dominant feature of this illustration.

Baily's representations were not accurate and so he had new illustrations prepared by another artist and published in 1870 (See Zammit Maempel 2007, p. 48-9).

Can we sufficiently appraise the artistic talent of Baily? George Victor Du Noyer (1817-1869), a contemporary Senior Geologist on the Survey, who started with Portlock's Ordnance Survey in Londonderry, was lauded in 1995 with an exhibition of his works in the National Gallery of Ireland which was accompanied with an excellent illustrated catalogue (Croke 1995). The question could be posed as to why Baily has not received as much recognition. Clearly he could paint as well as draw, shown by an uncatalogued large (c. 70 x 45cm) watercolour painting in the GSI archives (Figure 6), but he possibly laboured at it rather than with the flair and speed of Du Noyer. Although he produced large drawings and paintings for Jukes for his College lecture series, none are known to have survived in the GSI archives, and this is probably the main reason he has not hitherto gained the reputation accorded to Du Noyer. There is absolutely no doubt that his talent lay in the precision and detail of accurate portrayal of the fossils, as noted previously in discussion of his defence of Forbes. His artistic qualities can be seen in the detail of his lithographs and fine woodcuts that were used to illustrate many scientific communications. In his obituaries the eulogists both comment on the quality of his work (See Appendix 4).

It is easy to imagine that in a small geological community in Ireland, such talents as Baily possessed were in demand, and his assistance must have been often sought. The list in Appendix 2.4 lists a sample of his efforts on other people's behalf for publications, whether as the Dublin palaeontological authority, or as a skilful illustrator. This list is by no means comprehensive, but is indicative of the comfortableness Baily had in dealing with specimens, of all types.

The appointment of Baily to the Geological Survey of Ireland

After Salter's refusal to deal with his Irish responsibilities, Jukes was desperate in his need of a palaeontologist to progress the Survey and in a letter of 28 October 1856, and in the 1856 Annual Report, made detailed pleas for assistance. The Director General of the Survey, Roderick Impey Murchison wrote to Earl Granville on 28th May 1857, arguing that as the British Association for the Advancement of Science (BAAS) meeting was due to take place in Dublin the following year that it was imperative that someone with palaeontological experience be sent to Ireland. He requested that Baily be transferred at the rank of Senior Geologist at a starting salary of £250 per annum. This was to rise annually by £10 until a max-

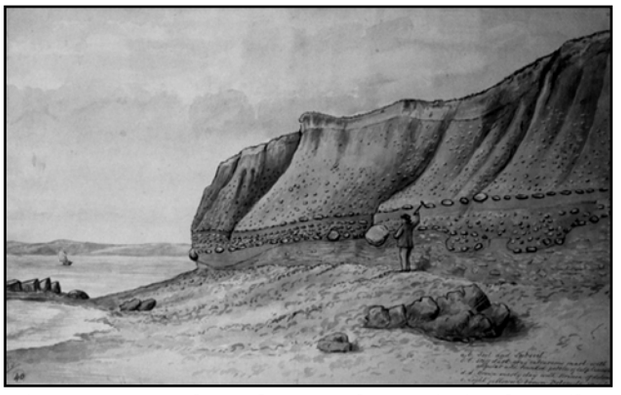


Figure 6. Uncatalogued watercolour painting by Baily of glacial deposits near Sutton in Co. Dublin. The lettering and caption on the strata represented suggest it may be one of the works contracted from Baily by Jukes for his lecture series (GSI collection).

Figure 7. The Staff of the Geological Survey of Ireland c. 1860. Back row from left: A.B. Wynne, G. Mooney, J. Kelly, J.B. Jukes, W.H. Baily; front row from left: F.J. Foot, G.V. Du Noyer (From Praeger 1949).

imum of £300 was reached (GSM 1/7, p. 416-7). This request was sanctioned and Baily joined the Irish branch as Senior Geologist (Acting Palaeontologist) in July 1857. He joined a Survey that contained men of some quality (Figure 7).

Baily's role in the GSI and the assembly of its fossil collections

The newly formed GSI in 1845 inherited the Portlock Collection, and briefly occupied the Custom House, before moving to 51 St Stephen's Green in 1846. In 1870 it moved around the corner to 14 Hume Street where Baily occupied a top floor room. The employment of fossil collectors meant that from the outset specimens were being accumulated, under the general guidance of the Director, and locally through the geologists themselves. Herries Davies (1983, 1995) has recorded in some depth the development of the Museum of Irish Industry under Sir Robert Kane, in an uneasy co-existence with the GSI. Within this museum the GSI collections were kept and then displayed to the public, then later as the Museum of Science and Art, before a brief exposure within the National Museum of the fledgling Irish Free State. In historical analysis it is simply a classic modern collection, very typical of many natural history collections that were critical to the establishment of numerous western European larger and national museums.

The collections themselves are the product of deliberate collecting in the field. Baily was not the sole collector based in the Dublin office of the Geological Survey - the assembly of the fossil collection was necessarily a team effort, the long term accumulation (1845-1890 in its main phase) of significant specimens by a small but dedicated group. Specimens were sent in by the Geologists and the Fossil Collectors for examination by the Acting Palaeontologist. In 1858 *Instructions to Officers engaged in the Collection and Determination of Fossils* were issued from London, but they seem to have been largely stating and reinforcing what had already become practice, rather than establishing a new routine. Usually the areas in which the Fossil Collectors should work was determined by Jukes, but on occasion when he was absent due to illness, Baily was instructed to direct the activities of the fossil collectors.

On some occasions Baily would travel into the field himself or with the other geologists to sample productive horizons. The *Annual Report* for 1858, for example, noted that Baily spent 28 days that year out collecting (a number which many museum curators today would readily embrace!). His efforts seem to have been directed, not to the routine mundane mapping work, but focused on the interesting sites, the topical or those critical to the understanding of regional stratigraphy. While in the field he did encounter some difficulties-in 1861 he was stopped making excavations at Kiltorcan, Co. Kilkenny by the landowner (GSI letterbooks 26th August 1861). This site had produced wonderful Old Red Sandstone facies land plants including *Archaeopteris* and the freshwater mussel *Archanodon*, and was the subject of a number of papers by Baily. In 1866 Baily and the two Fossil Collectors employed by the GSI were visited by the local police who though their activities were suspicious (GSI letterbooks 29th October 1866). Later Baily requested the assistance of one of the Fossil Collectors and later still Alexander McHenry was taken on as an Assistant Palaeontologist. Even in Dublin problems did arise - on one occasion he complained that coal was being stolen overnight from his room, inferring that it was too cold to work!

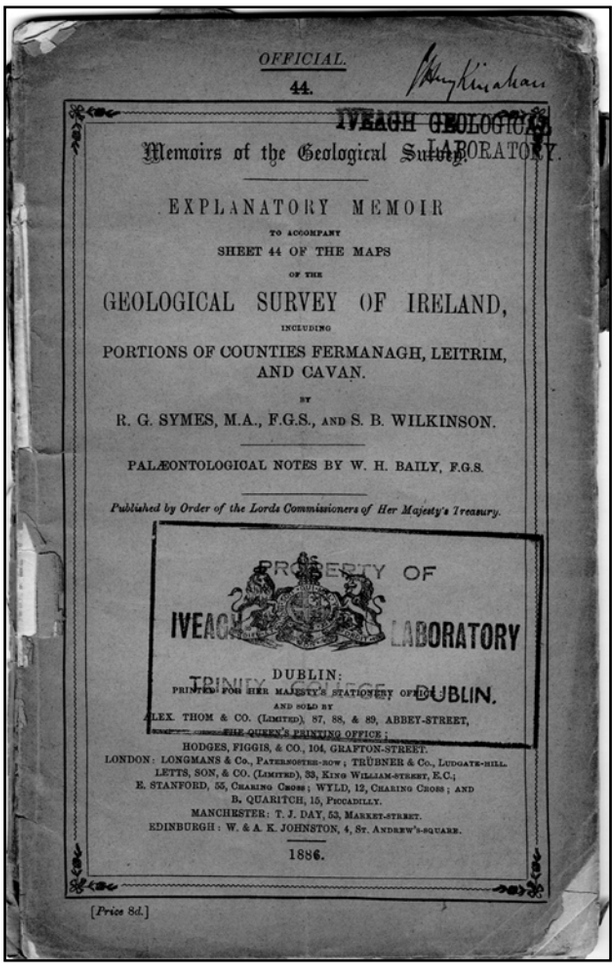
The Annual Reports give a clear record of the number of specimens, averaging three to four thousand each year that had been collected (Table 1). Of these, once identifications had been made and confirmed if necessary, specimens were selected for the Museum and stuck to labeled tablets, others selected for distribution to other branches of the Geological Survey in London and later Scotland, and some were rejected as worthless and thrown out. In 1868 Baily stated that he had examined over 30,000 fossils since his arrival in Ireland, had arranged 12,000 of these on labeled wooden tablets and had distributed 5,000 duplicates (GSM1/16, p. 168). Increasing the total

Table 1: Numbers of specimens collected and accounted for in different ways in the GSI Annual Reports. In varying styles of breakdown the number of fossils collected is recorded, with emphasis on the particular achievements of the year in question in terms of specimens examined, mounted on tablets for the museum or distributed as duplicates to other museums, and often a justification for lack of progress based on special circumstances, such as dealing with an accumulated backlog of fossils needing examination, for example in 1860, when nearly 8000 fossils were examined.

Year	Total collected	Added to Museum	Duplicates	Tableted	Examined/ Named
1856	5500				
1857	5616				
1858	5726	651	780	651	1867
1859	2270				
1860	1700	1500	2000		7958
1861	1577		[24 boxes]		
1862	7687		3587	2583	
1863	2588		1303		
1864	2192	271	956		
1865	1163				2500
1866	3580			800	2010
1867					
1868	6520		2300		3000
1869	6600			1200	4800
1870	3238	400			2000
1871	2500	500			
1872	1500				
1873	3375				3000
1874	2864				2500
1875	3968				3000
1876	1000				3500
1877	500				3251
1878	1300				3755
1879	1200				2500
1880	1150				3000
1881	900				900
1882					
1883	800	350			2000
1884	1610				
1885	1300				
1886	5-600				1300
1887	600				1600
1888	Baily's death				

sum of knowledge of Irish stratigraphy was the purpose of collecting, not to simply increase numbers of the collection.

Another of Baily's main duties was to provide accounts of the fossils encountered during the mapping programme of the GSI. In total Baily contributed reports on Palaeontology to 66 *Memoirs* (Figure 8). For many of these he provided woodcuts illustrating the most important or stratigraphically interesting fossils (Appendix 2.2). Jukes and others may have directed the mapping programme and possibly even the day to day work of the Fossil Collectors, yet ultimately Baily was the architect of meaning from the collection. In several letters within the letterbooks of the GSI, Jukes was at pains to insist that he alone, as Director, should have the final say on the stratigraphy, and what formation (in the assumption of direct equivalence of the geology found in Britain) different rocks belonged to, based principally on their fossil content. Baily was required to defer to his superior officer's judgement, yet realistically, Jukes had to rely on Baily for the identification and differentiation of different fossil species.


OFFICIAL.
44.
IVEAGH GEOLOGICAL LABORATORY.
Memoirs of the Geological Survey.
EXPLANATORY MEMOIR
TO ACCOMPANY
SHEET 44 OF THE MAPS
OF THE
GEOLOGICAL SURVEY OF IRELAND,
INCLUDING
PORTIONS OF COUNTIES FERMANAGH, LEITRIM, AND CAVAN.
BY
R. G. SYMES, M.A., F.G.S., AND S. B. WILKINSON.
PALÆONTOLOGICAL NOTES BY W. H. BAILY, F.G.S.
Published by Order of the Lords Commissioners of Her Majesty's Treasury.
PROPERTY OF
IVEAGH LABORATORY
TRINITY COLLEGE DUBLIN.
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PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,
AND SOLD BY
ALEX. THOM & CO. (LIMITED), 87, 88, & 89, ABBEY-STREET,
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HODGES, FIGGIS, & CO., 104, GRAFTON-STREET.
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MANCHESTER: T. J. DAY, 53, MARKET-STREET.
EDINBURGH: W. & A. K. JOHNSTON, 4, ST. ANDREW'S-SQUARE.
1886.
[Price 8d.]

Figure 8. Cover of Geological Survey of Ireland Memoir 44 that was issued in the year of Baily's death (1886).

Baily's status within GSI: a cause for embitterment

Although initially sent to Ireland as a Senior Geologist which put him second equal in the salary scales for the Irish office (after the Local Director Jukes, equal with George Victor Du Noyer), Baily quickly began to seek further promotion, and thus an increase in his salary. He never attained the full title of Palaeontologist which he felt would put him on equal rank with Salter and others in the GSGB, and in time this rankled heavily with him. Whether the lack of title was the main source of upset, or whether it was his impecunious state that was forefront of his pleading we shall never know, but both were factors in his unhappiness over a period of 31 years. He regularly sought promotion through letters to the Lords of the Department of Education, via the Local Director Jukes, and later Edward Hull. He submitted Memorials, detailed pleas for due recognition for his abilities, his responsibilities, long service and the perceived injustice of his appointment not being made a full one.

He first applied for promotion in October 1859 only a short time after arriving in Dublin (GSM 1/8, p. 27), and when that failed he later applied for his post to be raised to Palaeontologist. This appeal was rejected by the authorities in London as they didn't believe that the Geological Survey needed two palaeontologists (GSM 1/8, p. 321-2). By 1864 his salary was £340 and it reached a maximum of £350 per annum in 1865. On 1st April 1868 Baily was appointed Demonstrator in Palaeontology in the Royal College of Science for Ireland, a position that was in addition to his post at the GSI, and for this he received an additional £100 per annum (GSM 1/9, p. 21-2). In recommending him, Murchison wrote: "Mr W.H. Baily … is a most-fit and proper person to fill the new office; and being a deserving public servant, with a large family, it has long been my wish to see him recompensed. Mr Baily is really a sound Palaeontologist" (GSM 1/9, p. 22). For this he had to give a number of classes in Dublin and in other towns in Ireland. He held this position until his death.

Again in June 1868 he requested a rise given he had to pay a premium of £50 per annum in life insurance and had also to pay income tax. He felt that given the nature of his job, and the fact that he had a large young family that he needed insurance cover in case he had an accident and couldn't provide for them (GSM 1/16, p. 168). He also pointed out that the move to Ireland cost him personally £100, and that due to the high cost of living, clothing, provisions and house rent (GSI letterbooks 10th February 1866) that he had to sell his London home to cover expenses (GSI incoming Guardbook 9th September 1872). Sadly for him all his efforts and pleas fell on deaf ears, with senior officers refusing on occasion to even submit his applications so soon after a previous refusal, for fear of displeasing 'the Lords'. Some correspondence between Murchison and others points to the fact that his salary was not disparate from that of the 'Palaeontologist' in the GSGB (GSM 1/8, p. 480; 1/9, p. 251) - Salter had started on a salary of £250 when appointed in 1854 (Secord 1995: 66), and that in any case the responsibilities in London were greater than in Dublin, although Salter's role there was soon reduced due to his various limitations (Secord 1995: 66), and that in the wider view from London, his claims were unsubstantiated.

He applied for the vacant Chair of Zoology at the Royal College of Science for Ireland, that had become available on the death of John R. Kinahan, but although getting permission from Murchison to hold this position concurrently with his Survey post

(GSI letterbooks 21st February 1863), his application was unsuccessful. It shows the extent that Baily would go in seeking additional funds by applying for a Chair that he frankly was poorly equipped to hold. Finally in 1881 in his final attempt to free himself of his Irish post and its salary he applied for the position of Palaeontologist at the Survey in London (GSM 1/26, p. 100). This had become vacant when Robert Etheridge resigned, but by then Baily was in his mid-60s and he was not appointed.

The main reason for these pleas were probably not simply a quest for additional status, but for the additional salary that would come with such promotion. Baily appeared to be frequently short of money, as Sir Roderick Murchison attested to when he received the Wollaston Fund for 1867 from the Geological Society of London on his behalf. Baily had been unable to receive the award in person from the President William Warrington Smyth, as perhaps, ironically, he could not afford to travel across the Irish Sea. Murchison commented: "while my deserving friend Mr. Baily is rich in fossil lore, and, I may add, in children, he is, like too many men of science, poor in sovereigns" (Murchison in Smyth 1868).

Throughout his career there is evidence that he sought ways of augmenting his salary. Commissions for artwork certainly helped his financial state at times. Jukes who was also Professor of Geology at the Royal College of Science commissioned Baily to produce 48 large geological illustrations for use in his classes. For these Jukes agreed to pay Baily £1 each. However Baily was slow to deliver and even requested an advance of the fee. This later caused animosity and problems between the two men (see below). In 1862 Jukes published his *Student Manual of Geology* which contained many woodcuts of fossils executed by Baily. It is obvious that he was paid for such a commission, and we would suggest would not have undertaken it unless this had been agreed. Jukes wrote in the forward:

> "By the liberality of the publishers I have been enabled to take advantage of the presence of Mr W.H. Baily in Dublin, who compiled for me lists of characteristic fossils, which, with some modifications, are those given in the third part of the work. Mr. Baily also drew on the wood the figures which make the fifty "fossil groups" by which that part is illustrated."

At times issues of finance, family, status, and the development of a scientific reputation threatened to overwhelm Baily and he was granted sick leave on more than one occasion due to anxiety and overwork. An uneasy relationship developed with Jukes, his immediate superior, and this finally exploded in August 1861 following a meeting between the two that initially took place in Baily's office but then reignited shortly afterwards in Jukes'. After the meeting the ultimate sanction, that of the removal of Baily from Dublin was requested. On 27th August an exasperated Jukes wrote to Murchison in London and stated that "I can no longer tolerate Mr Bailys behaviour here. … I must therefore request that Mr. Baily be removed from the Irish branch of the Geological Survey at the close of this official year or as much earlier as circumstances will allow" (GSI letterbooks 27th August 1861). Almost immediately Baily stated that as he was on leave when the incident took place it was a private matter and not subject to official record. He refused to apologise to Jukes as he felt that it was he who deserved an apology on account of being called an "ungrateful beast" and "damned scoundrel" (GSI letterbooks 14th October 1861).

A month later Jukes followed his first letter up with a long missive to Murchison in which he gave his reasons for the request, and they give some insights into Baily's character (GSI letterbooks 26th September 1861). Jukes pointed out that this had not been the first incident but that he had held back making any complain on account of his concern for his Senior Geologist's family (who would be destitute should he lose his position) and the fact that he was not keen to lose the palaeontological expertise that Baily possessed. He complained that *Memoirs* had been delayed as the palaeontological report was not submitted to deadline. He pointed out that on Baily's arrival in Dublin he had been told that there was a great deal of work to be done sorting out the collections Jukes considered that little work had been done to remedy the chaos, and when he mentioned this, Baily "burst into a fit of fury, and with black looks, a loud tone, and insulting gestures, told me that he had been longer on the Survey than I had". Jukes also lamented paying Baily in advance for some commissioned artwork, and this incident was fuelled further when Baily requested an advance on additions work so that he could attend the BAAS meeting in Manchester where he could meet his friends, relax and present a paper. Jukes refused to advance the money and suggested that Baily travel down the country and spend a leisurely week collecting fossils; Baily retorted that fieldwork actually cost him money. Jukes replied that in any case if Baily was short of money spending it attending a scientific meeting didn't make sense. Baily felt that participation at meetings would raise his scientific reputation; Jukes thought otherwise.

Jukes did acknowledge that his inferior officer had in the recent past had got through a great deal of but "it has been done in a grudging and reluctant manner, as if he were working under an oppressive taskmaster, and he has never given me that hearty and cheerful assistance, I had a right to expect of him."

By 23rd October Baily had simmered down and thought it prudent to request Murchison to disregard his letter of 14th October 1861, and the following day he relented and said that he was willing to make the 'requisite apology to Mr Jukes" (GSI letterbooks 24th October 1861). No doubt Murchison had set out his stall, quenched the flames of argument, and told the protagonists to behave appropriately.

Baily wasn't removed from his Survey position, and even after the events of August 1861 his lack of promotion seems to have been a thorny issue that underpinned much of his activities. In all probability it accounts for a degree of tardiness in producing reports for the *Memoirs*, in a reduction in the rate of fossils examined, and a withdrawal from the affairs of geologists in Dublin, more evident in his later years. It is hard not to feel some sympathy for the injustice of his career stasis, however much it was perceived rather than real.

Baily's involvement in scientific circles in Dublin

Dublin was a thriving city in the mid-1850s and had recovered from the loss of its Parliament and direct rule in 1801 to be regarded as many as being the second city of the Empire. Many institutions catered for the scientific populace, of which the Royal Irish Academy and the Royal Dublin Society were the most prestigious. Baily became involved with both and with the smaller specialist geological community in Ireland.

On 9th December 1857 soon after arriving in Dublin Baily was proposed for Fellowship of the Geological Society of Dublin; his proposer was Jukes, his new boss, and his seconder Du Noyer, his GSI colleague. The nomination accepted, Baily paid soon after the entrance fee of £1 and the Annual Subscription also £1. For the remainder of his life he was involved with the organisation and with its successor the Royal Geological Society of Ireland, but it was a relationship that was not always convivial. The Society met monthly for General Meetings when up to four papers were read, some of which were later published in its Journal. Baily attended his first meeting in March 1858, and read his first paper 'On *Limulus* from the Coal Measures Bilboa Collery, Co. Carlow' at the 9th June 1858 meeting. He served on its Council for several periods (1859, 1863-1865 and 1871-1874), and published seventeen papers in its *Journal*, and the Minute Books and records of meetings now house in the Geological Museum, Trinity College, Dublin and where the preceding information is drawn, also show that he was actively involved in many meetings and frequently spoke and contributed opinions and judgements on other people's papers, as well as presenting his own.

However he did not maintain sustained and unbroken Fellowship. The list of Fellows published annually in the *Journal* was divided into several categories: Fellows who have paid life composition; Fellows to have paid half-life composition; and Fellows who paid annual subscriptions. Baily was always listed as being part of the latter category and never took out a subscription at the more expensive end of the scale. On at least two occasions he resigned his Fellowship: in 1865, after when he rejoined again two years, and again in 1874 at which time he also resigned his place on the Council. The reasons for the second resignation lie in fees payable for the production of illustrative plates. In the Minutes of the Council Meeting it was "Resolved that the remuneration to be paid to Mr Baily for illustrating his own papers be at the rate of one guinea for each plate." (RGSI Minutes of Council Book). A cheque was authorised in favour of Baily for 2 guineas. One can only imagine that Baily wanted to be paid to prepare his own illustrations for his own papers and that the Council either resisted such a move, or wished to pay less than was demanded. Following some accommodation on the matter, and agreement on payment, it is noted at the bottom of the same Council Meeting minutes that he had resigned from the Council. Following his second resignation Baily failed to rejoin the Society even though he continued to publish papers in its *Journal*, and attend some monthly meetings as a Visitor often in the company of his son Henry William Baily (RGSI Meeting Book).

He also contributed a small number of scientific communications to the Royal Dublin Society whose headquarters were in Leinster House, an impressive seventeenth century townhouse which now serves as the Dáil (Parliament). Perhaps Baily's most significant contribution to this Society was his publication in 1863 with Alexander Carte (1805-1881) of *Plesiosaurus cramptoni* (now *Rhomaleosaurus cramptoni*) a large plesiosaur, which they named for the famed Dublin surgeon Sir Philip Crampton (see Benton and Taylor 1983: 415). This specimen had

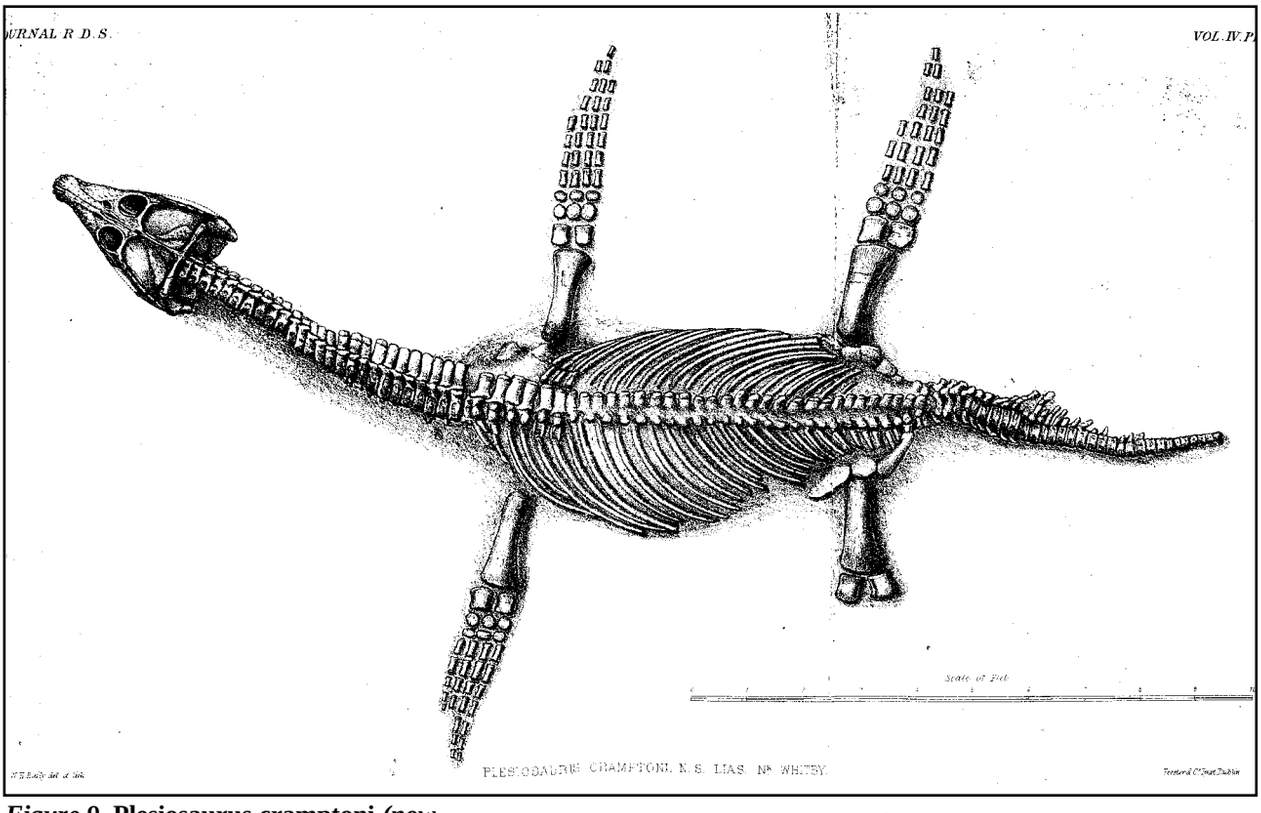


Figure 9. **Plesiosaurus cramptoni** ***(now*** **Rhomaleosaurus cramptoni*) from the Lower Jurassic of Whitby, Yorkshire (From Carte and Baily 1863).***

been collected in 1848 from the Upper Lias at Whitby in Yorkshire and moved to the home of the Marquis of Normanby. Later it was given to Crampton who moved it to Dublin and donated it to the Royal Dublin Society. They then displayed it in their museum, and Carte and Baily produced a detailed description with a fine lithograph by the latter (Figure 9). Today the specimen is not on display in the National Museum of Ireland into which the RDS museum became in the late 1877, but recently its impressive skull has been prepared (Smith and Dyke 2008).

He was also active as an Honorary Member in the Dublin University Zoological and Botanical Association which had been established by the naturalist Robert Ball. Designed to draw together the academics, professions and students under one umbrella organisation, Baily contributed a number of papers which were published, as well as serving on its Council for a period.

He was elected a Fellow of the Linnean Society on 19th March 1863 at the same meeting as George Dickie (1812-1882), an Aberdeen-born naturalist who had held a Chair of Natural History at Queen's College, Belfast until 1860. It appears that Baily made few contributions to the life of the Linnean Society. Nine year later on 8th April 1872 he was elected a Member of the Royal Irish Academy. This was an honour of some significance as not all men of science at the time were admitted to Membership. On 9th February 1873 he read a paper on the Kiltorcan fossil flora to the Academy, but his contributions were limited to only two papers published in 1875 and jointly with George Kinahan in 1883 in its *Proceedings*.

He was also a Honorary Corresponding Member of the Royal Society of Liège, of the Natural History Societies of Dresden and Strasbourg, and of the Geological Society of Belgium (GSM1/26, p. 101).

Baily and the British Association for the Advancement of Science

Like many Irish-based scientists Baily participated in many of the British Association for the Advancement of Science meetings that were held annually in towns and cities in Britain and Ireland. He joined in 1857 but made his first contribution, on fossils from South Africa, earlier in 1854 at the meeting in Liverpool (See Appendix 1.1 for a list of his contributions between 1854 and 1883). In all he made 22 contributions and in general these, with the exception of Committee reports were published in the Annual Reports as abstracts and full papers often appeared elsewhere (see Appendix 1.2). He enjoyed attending the meetings where he could meet his friends but he also felt that they offered him the change to enhance his scientific reputation (GSI letterbook Jukes to

Murchison, 27th September 1861). Between 1856 and 1883 he missed the Oxford meeting in 1860 probably on account of the tragic loss of two of his children that year, and didn't attend between 1865-67, 1870-1874, and 1876-77. He must have made a special effort to attend the meeting of 1875, and no doubt participating gave him great pleasure as it was held in Bristol, his home town.

Much of the work of the BAAS was carried out by Committees appointed to investigate various topical issues. Baily sat on one and acted as Reporter (later termed Secretary) to these: the Committee that studied the fossil flora at Kiltorcan (1869) for which the Association awarded £40 (BAAS Annual Report for 1869, 1870; Howarth 1931), the Committee that studied the fossil flora of Ireland (1873; £20) and the Committee appointed to study and collect the Tertiary Flora of the North of Ireland (1880-1882; £20). He wrote on the Kiltorcan flora at the Norwich meeting in 1868 (Baily 1869) and reported on behalf of the Committee at the next meeting in Exeter (Baily 1870). No report was forthcoming for the Committee on the Fossil Flora of Ireland established at the Brighton meeting in 1872. However he carried out a great deal of work on the Tertiary floras of the north of Ireland and penned four reports for the Association (Baily 1880, 1881, 1882, 1884). Three of these were illustrated with lithographs by Baily.

How the money granted by the BAAS was spent by the committees is unknown but given the reports bear all the hallmarks of Baily's work, and show little evidence of input from colleagues it is reasonable to suggest that Baily received most of it to aid his research.

During Baily's career in Ireland the Association met on the island on three occasions (Morrell 1990). The first in 1857 in Dublin and secondly in 1874 in Belfast. This prompted Baily to write a short sketch of the geology of the city and its neighbourhood (Baily 1874). Four years later the Association met in Dublin and Baily served on the committee charged with producing the official handbook. For this he penned an account of the palaeontology of County Dublin (Baily 1878) and this contribution was also published elsewhere in 1880 in both the *Journal of the Royal Geological Society of Ireland* and the *Scientific Proceedings of the Royal Dublin Society* (Baily 1880). As for the earlier Belfast meeting he wrote a short account of the geology of the area adjacent to the host city (Dublin and Wicklow) which appeared in *Hardwicke's Science Gossip* (Baily 1878).

Baily's research and published works

Amongst the numerous papers Baily had published (see Appendix 1.1 and 1.2), the most noticeable feature is the diversity of topics which Baily had sufficient grasp of to expound on in print. Coupled with a natural talent, his early experience in Bristol and London illustrating fossils for other people, and then across the gamut of Irish geology, was more than adequate for him to tackle the full spectrum of fossil animal and plant kingdoms, and the entire Phanerozoic. Although he was competent with fossils, his naturalist abilities with modern species were more limited, and lists of shells from ice dredged marine deposits around Ireland were often provided by other specialists for the GSI memoirs. However, as Figure 10 shows, he was not unaware of living relatives of the fossils he identified.

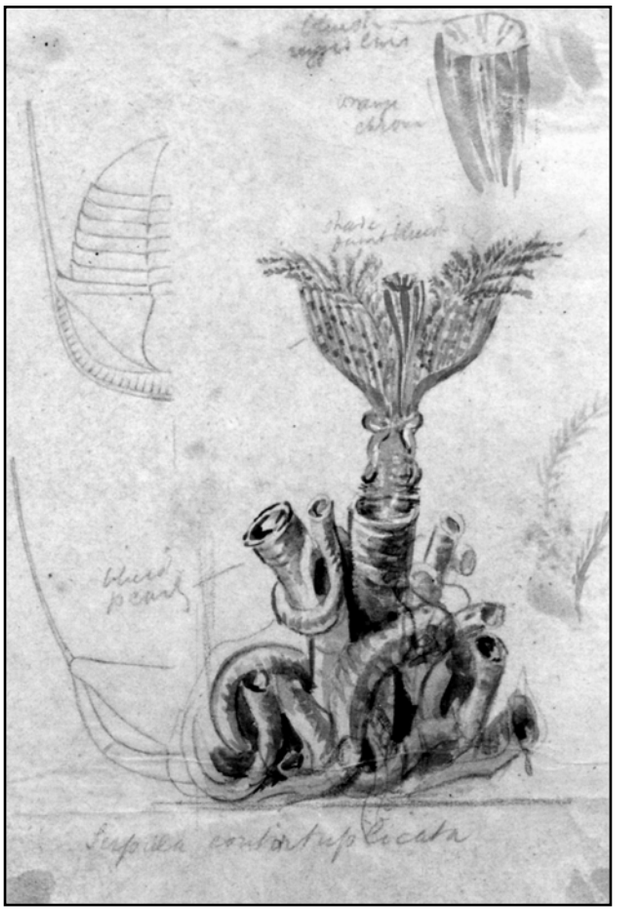


Figure 10. Uncatalogued watercolour of* Serpula contortiplicata *from GSI archive file of Baily's proofs of Figures of Characteristic British Fossils.

In many instances the same paper appeared in more than one journal, for example his paper on *Solarium* was published by the Dublin University Zoological and Botanical Association in 1860, whose papers were republished in the *Natural History Review* edited by the geologist Rev. Samuel Haughton. It reap-

peared a third time in the *Annals and Magazine of Natural History*. Later issues of the *Journal of the Royal Geological Society of Ireland* were printed at the same time as an all but identical edition issued by the Royal Dublin Society as a means of saving money for the geological group. In none of Baily's papers does he indicate or allude to this publication scheme. Although in some cases, work on a particular fauna was published to maximum extent by variations on a theme, as is frequently practised today, Baily's papers are direct reproductions of exactly the same paper. This was a normal practice in Victorian scientific circles and not an anomalous circumstance associated with Baily himself.

In general his research interests can be grouped into several major categories: fossil chitons and arthropods, fossil plants of various ages, and fossil amphibians, although his papers did cover other areas too.

He became interested in fossil chitons, members of the molluscan Class Polyplacophora following a discovery of material in Carboniferous limestones in Limerick. He published a number of papers in 1860, one of which discussed possible Silurian chitons. Only recently has Baily's work been reassessed using his original material from the GSI collections and his taxon *Chiton thomondiensis* Baily, 1859 has been reassigned to *Pterochiton thomondiensis* (Baily, 1859) (Sigwart 2007).

He developed an interest in palaeobotany and as noted earlier he spent time collecting at Kiltorcan, Co. Kilkenny in what was then considered to be late Devonian sediments. They are now acknowledged to be earliest Carboniferous in age. Kiltorcan was to provide Baily with some beautiful material, and he reassessed a number of taxa described earlier by Forbes and reported the taxon *Sphenopteris hookeri* for the first time. Another plant *Sagenaria bailyana* (Figure 5) was named for him by Wilhelm Philipp Schimper. While much of the material examined is now in collections in Dublin (GSI, National Museum of Ireland, and Trinity College, Dublin some was given by him to the Hunterian Museum in Glasgow in 1870 and 1871 (Stace *et al*. 1987: 21 who give his name incorrectly as 'Bailey, W N').

He received grants from the BAAS and embarked on a productive period of study on the Tertiary plants of the north of Ireland which were the focus of one paper and later four Reports to the Association (Baily 1869, 1880, 1881, 1882, 1884)

In 1865 an unusual and important suite of fossils was discovered at Jarrow Colliery, Co. Kilkenny, and subsequently the amphibians were described in detail by Thomas Henry Huxley in 1867 in a paper co-authored with the Trinity College, Dublin botanist E. Perceval Wright (Huxley and Wright 1867). Baily also worked on Jarrow material and took an interest in particular in the amphibians (Figure 11) (Baily 1877), and the plants of which *Pecopteris edgeii* (Baily 1859) and *Adiantites kinahani* (= *Sphenopteris irregularis*) were described as new. His attention on coalfield assemblages was not restricted to that at Jarrow, but he also published on the Ballycastle, Co. Antrim fossils and reported the presence of the rare crustacean *Belinurus* from central Ireland.

Much of his early work as a draftsman was in illustrating echinoids for others. The hours that he spent

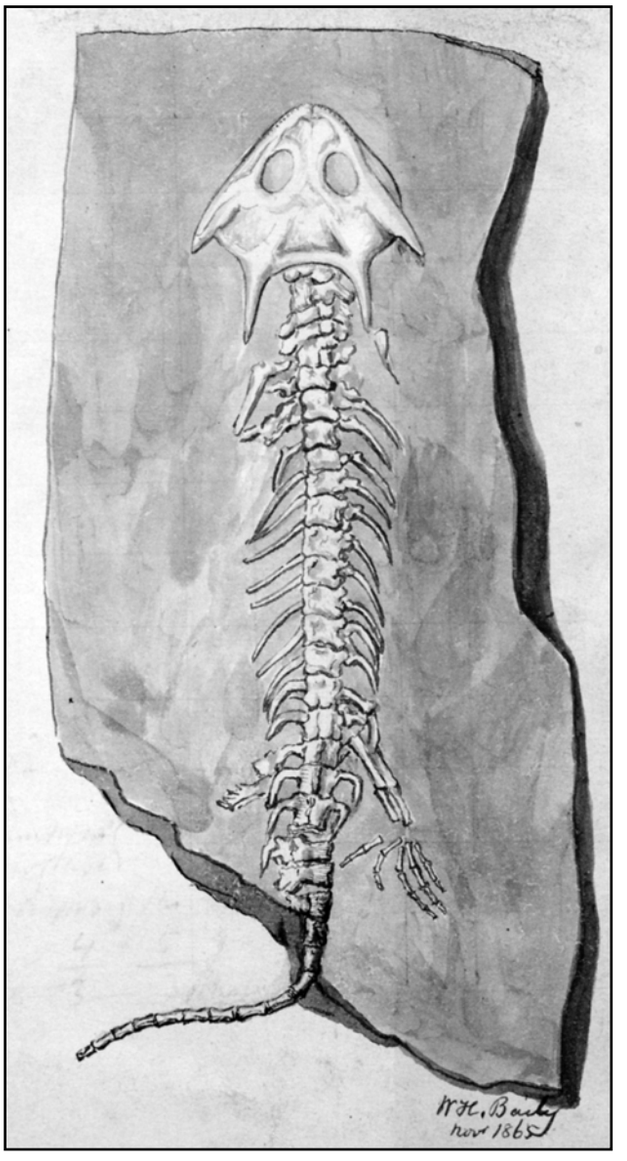


Figure 11. Watercolour of the Pennsylvanian (Upper Carboniferous) amphibian* Keraterpeton galvani *Huxley, 1867 from Castlecomer, Co. Kilkenny showing a conjecture of the tail length, November 1865. (GSI archives).

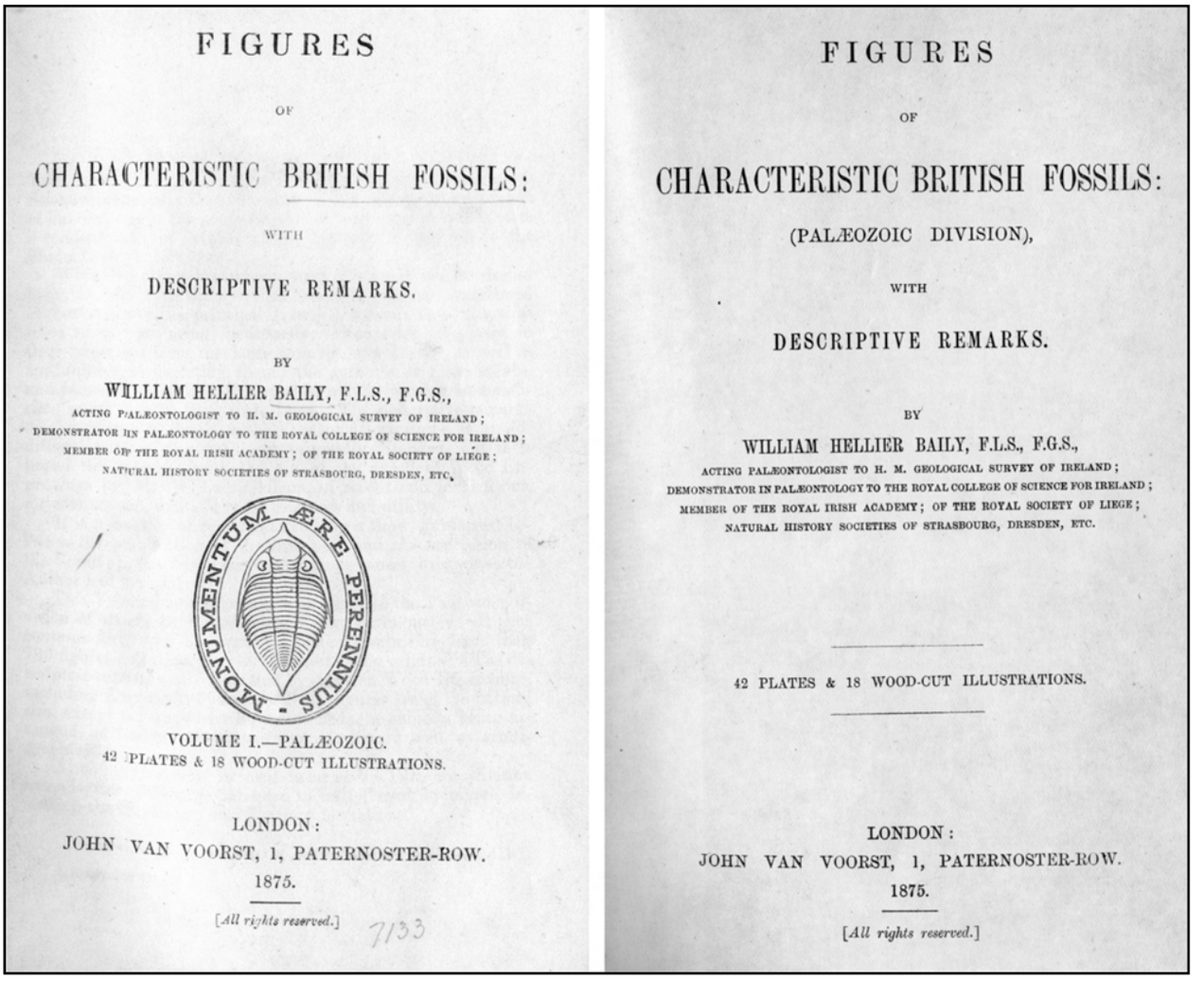
examining this material must have left a lasting affection for the group, and in Ireland he published on the Carboniferous echinoid *Palaechinus* among others (Baily 1865, 1877).

Much of his work can also be found incorporated into the work of others often as illustrator of important fossils, but in many cases simple verification or support of palaeontological judgements or opinions was sufficient and his name was cited as establishing the credibility of the ventured conclusions or opinions. Appendix 2.4 lists, as an example selection, the papers to which Baily made a significant contribution, sufficient to receive acknowledgement, in the *Journal of the Geological Society of Dublin* and the *Journal of the Royal Geological Society of Ireland*, during their twenty years duration. Some, where he supplies an appendix to someone else's work could be listed as papers in his own right, for example that of Hull (1871).

His final enterprise was a small book entitled *Rambles on the Irish Coast* which was published in Dublin in 1887 which retailed at 1 shilling and 3 pence. It examined the geology, natural history and antiquities of the Dublin coastline. It was his intention to "issue a series of the "Rambles" to be published occasionally, each being complete in itself, and the parts so arranged as to form, topographically, a continuous work". Death intervened before he could issue more than one volume.

Figures of Characteristic British Fossils: his masterwork

Baily had a vision of a gap in the market, and with his aspirations for more income, in the 1860s he set about producing an affordable identification guide to common fossils for the average person, or at least for the non specialist palaeontologist. It was certainly not an original idea, and in fact may have arisen from his earlier working relationship with Forbes, the Geological Survey Palaeontologist. A letter from Forbes to Sir Henry De la Beche probably from July 1846 (NMW De la Beche archive 552) includes his plan: "I am now going on with the plan on which I


FIGURES

OF

CHARACTERISTIC BRITISH FOSSILS:

WITH

DESCRIPTIVE REMARKS.

BY

WILLIAM HELLIER BAILY, F.L.S., F.G.S.,

ACTING PALÆONTOLOGIST TO H. M. GEOLOGICAL SURVEY OF IRELAND;
DEMONSTRATOR IN PALÆONTOLOGY TO THE ROYAL COLLEGE OF SCIENCE FOR IRELAND;
MEMBER OF THE ROYAL IRISH ACADEMY; OF THE ROYAL SOCIETY OF LIEGE;
NATURAL HISTORY SOCIETIES OF STRASBOURG, DRESDEN, ETC.

MONUMENTUM ÆRE PERENNIUS

VOLUME I.—PALÆOZOIC.
42 PLATES & 18 WOOD-CUT ILLUSTRATIONS.

LONDON:
JOHN VAN VOORST, 1, PATERNOSTER-ROW.
1875.

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FIGURES

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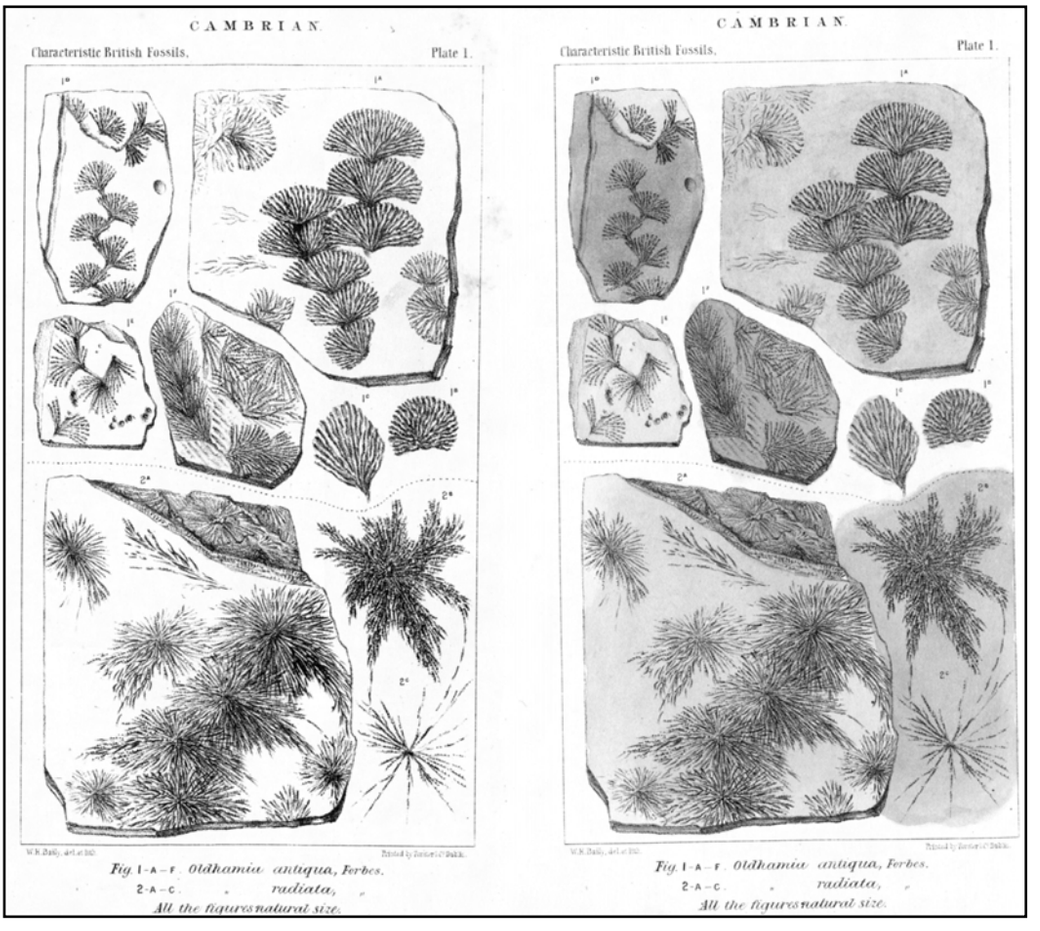
Figure 12. Two versions of the title page of Figures of Characteristic British Fossils (1875) (Copies in Department of Geology, Trinity College, Dublin (left), and PNWJ collection (right)).



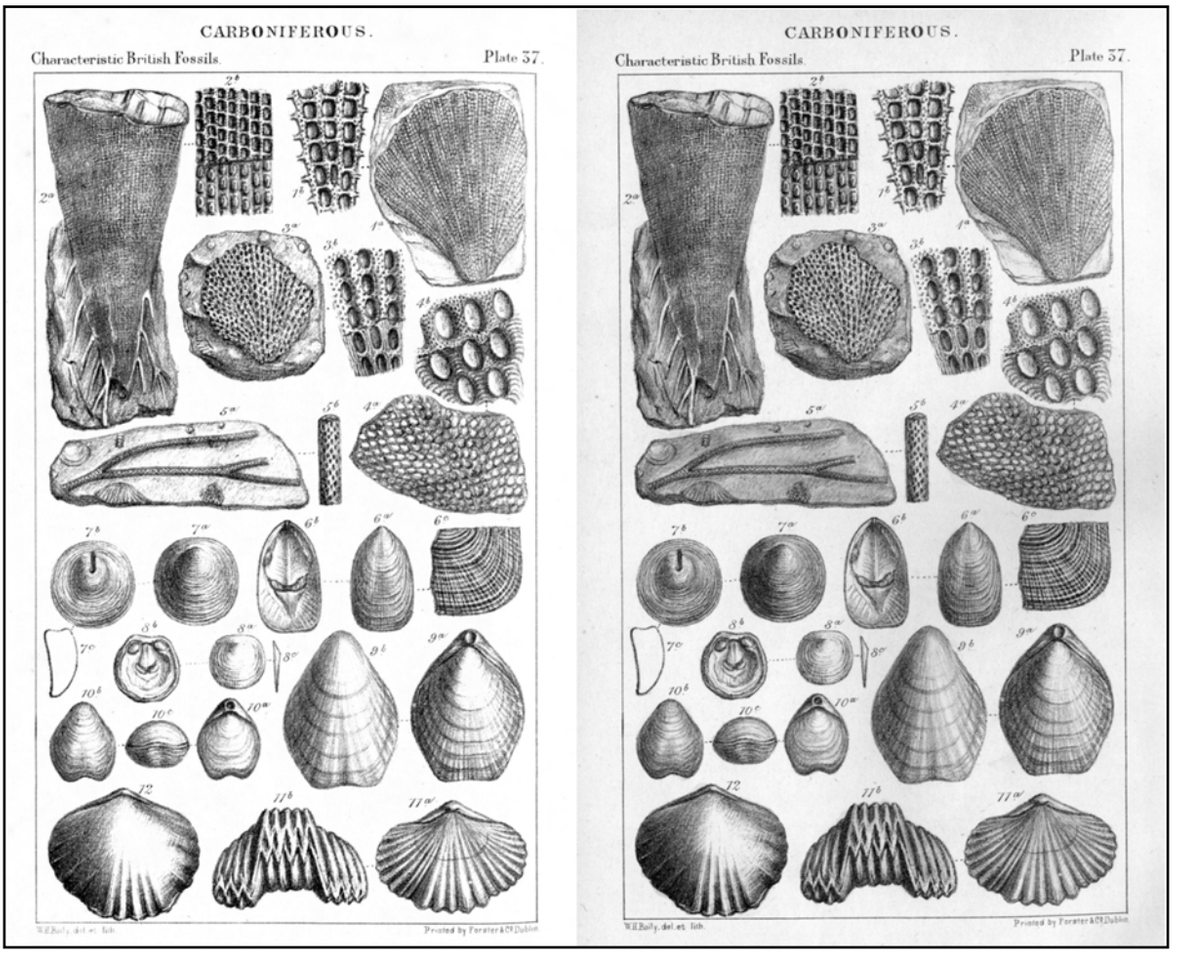


Figure 13. Plates from Figures of Characteristic British Fossils. Top. 13a. Plate 1, Cambrian trace fossils. Bottom. 13b. Plate 37, Carboniferous bryozoans and brachiopods. (Left-hand images monochrome (PNWJ copy); right-hand images hand-coloured (TCD copy)).

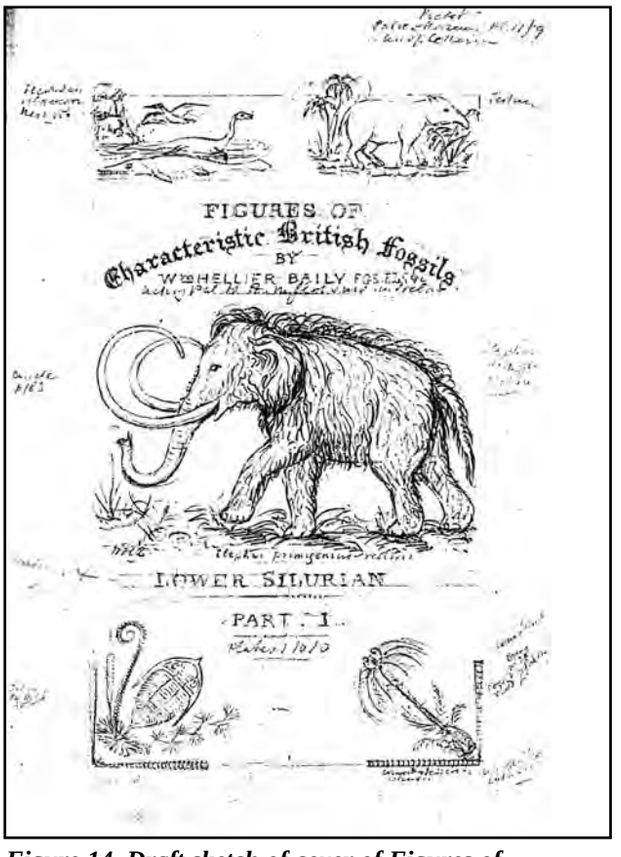


Figure 14. Draft sketch of cover of Figures of Characteristic British Fossils featuring a mammoth and other fossils (From GSI archives).

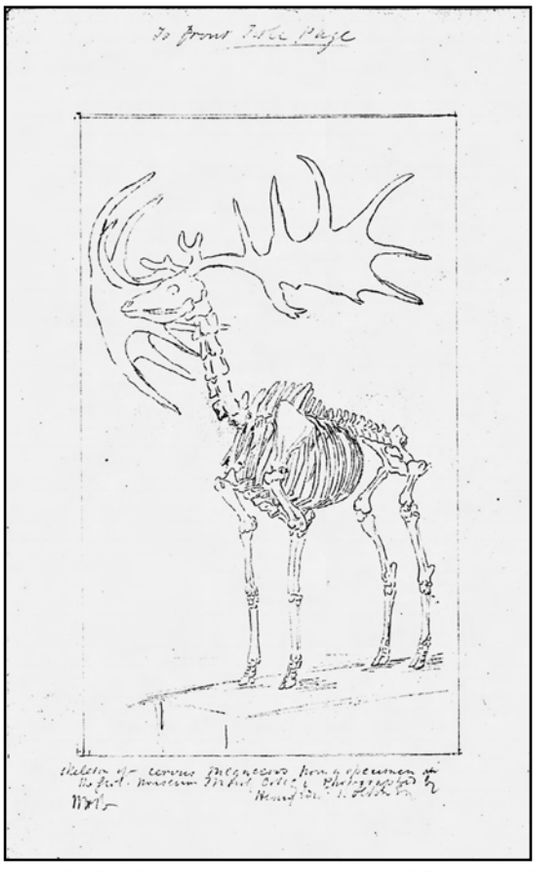


Figure 15. Draft sketch of frontispiece of Figures of Characteristic British Fossils featuring the Giant Irish Deer in the Geological Museum of Trinity College, Dublin (From GSI archives).

have resolved of having a good type of each fossil genus (especially palaeozoic) drawn and engraved so that the first series of plates issued will represent a series of genera, and then serve as a manual as well as for a British palaeontology. In this way Baily is now occupied on the Trilobites and Bone on the Gasteropods." It is possible that in publication of his *Figures of Characteristic British Fossils: with Descriptive Remarks, volume 1, Palaeozoic* (1867-75) (Figure 12), Baily was achieving the ambitions of his senior colleague.

In this respect Baily obviously had strong admiration for Forbes as a palaeontologist. He stood firm in his defence (Baily 1866) against Salter: "I cannot however, allow the remarks on some of these species to remain unrefuted as I consider them unjust to the memory of one so universally admired for the strict probity and correct scientific observation, so characteristic of our late highly esteemed friend." He was also quick to defend himself against the allegation that the artist had mingled features of different species of cystoids.

The publication of the *Figures* was commenced from 1867 onwards in four small sections of about ten plates each issued at a cost of five shillings. When in 1875 all the Palaeozoic periods had been covered, a title page was issued (in at least two different styles, see Figure 12) for the set to be bound, stating either that this was Volume 1 or covered the Palaeozoic Division. At the same time it is probable that the front section comprising the Descriptive Remarks (pp. i-lxxx) was also issued. When all parts were bound together they made up a handsome volume containing over 700 illustrations of fossils. Many of these are still in the collections of the Geological Survey of Ireland.

Some copies have monochrome figures (Figure 13a, b, left-hand images) whilst in others these have been hand watercoloured (Figures 13a, b, right-hand images). It is not clear to us whether they were originally sold in two different forms or whether Baily arranged for some plates to be hand-coloured at an extra charge to subscribers. Of especial interest are various draft sketches of the cover (Figure 14) and possible frontispiece (Figure 15), which are detailed with fossil illustrations including a Mammoth and a Giant Irish Deer respectively.

Unfortunately, despite the award of the Wollaston Fund from the Geological Society of London in 1867 towards the production of plates for the book (Smyth

1868), the project was not to have been the financial success that Baily must have hoped for, and no further volumes were produced. Eight years after its completion, Baily in 1883 wrote to the Geological Society of London seeking support for a second volume and judging from the reply he subsequently received he must have already embarked on its preparation:

> My dear Mr Bailey
>
> You may rest assured that anything I may do with the view of forwarding your interests at the Council of the Geological Society shall be done with unfeigned pleasure. I possess a copy of [page 2] the first volume of your "Characteristic Fossils" and highly appreciate its worth. For years past I have been wondering whether we should even have a second part, and I am glad to hear now that it is progress. But I am not very sanguine about the [page 3] Society voting a Grant for to be candid I had heard from another source that your case would be probably brought forward, and I therefore took the opportunity of privately asking some friends who are influential men in the Society to back up the application when it came forward. But they told me that although very willing [page 4] personally to support you they thought that the general feeling of the Council would be that grants should be made only for original research and not to assist in bringing out a book. Still they may be mistaken, and I hope that the Council will take a different view of the matter. You may rely upon my warm support wherever it comes forward." (Letter to Baily from Frederick William Rudler (1840-1915), 3rd February 1883; UCD School of History and Archives http://hdl.handle.net/10151/OB_0001008_AR, LA41/90).

The Council was unwilling to make a grant available and this response must have been a bitter blow to Baily. Even though Rudley's letter suggested some hope it is clear that a negative response would have been forthcoming; it was no doubt galling to Baily that firstly his name was incorrectly spelt, and secondly that the letter was written on paper bearing the crest of the Museum of Practical Geology, the institution where Baily had worked nearly four decades earlier. Whatever came of the draft (if any) of the second volume we do not know and it was never published.

Although rare today (occasional copies that come onto the antiquarian book market command prices of £120 or more), the model provided by Baily's work has surely influenced both the British Museum (Natural History) handbooks of British Fossils, and latterly the Palaeontological Association's Field Guide to Fossils series.

The 'doctrine' of characteristic fossils

In the work of the Survey, basic biostratigraphical techniques established in early days of geological development, had become accepted as standard, and were applied across the spectrum of geological environments, albeit at the ultimate discretion of the Director, as noted above, in the published maps and explanatory memoirs. The idea that particular fossil species are index species characteristic of certain geological periods held sway in stratigraphical work and informed the GSI's mapping for most of the 19th century. Baily himself was a firm proponent of this thinking, notably with his publication of *Figures of Characteristic British Fossils: with Descriptive Remarks, volume 1, Palaeozoic* (1867-75). The doctrine was not without its utilitarian critics, and Baily was quick to defend it, in geological meetings and in print too.

One exchange in print in the *Journal of the Royal Geological Society of Ireland* illustrates this. John Kelly had worked with M'Coy and Griffith and incidentally had not been afraid to expose some inadequacies of M'Coy's *Synopses*, by publishing the detailed locality information missing from them. Kelly (1864) published a paper showing how certain supposed index fossil species characteristic of certain strata actually occurred in adjacent strata, at the system level of subdivision. Baily (1864) is recorded in the Minutes as strongly denouncing the paper, in the gentlemanly parlance of the time, but plainly:

> "the conclusions with respect to the fossils arrived at by the author of the paper had been derived from insufficient and erroneous data, and therefore did not give anything like a fair result for such comparisons and deductions as he had made...".

With today's understanding of the complexity of biostratigraphy such debates evidence the continual growth of both the science and art of geology. The points discussed in Kelly's paper (1864) are largely reasonable objections, today easily explained by diachroneity of strata, facies control of fossil distributions, improved taxonomic discrimination and other factors, but to Baily who based his day to day work on the doctrine of characteristic fossils, and who steered the palaeontological course of the GSI mapping, using it as a tool, Kelly's ideas must have been threatening if not heretical.

Family life in Dublin

In September 1847 Baily married Ann Elizabeth Rawlins (or Rawlings) (1822- January 1887) in London (Letter J.W. Salter to De la Beche, 22nd October 1847, NMW De la Beche archive 1853), and the couple had eleven children, at least three of whom died young. A family of this large size was not unusual in Ireland at that time, even for Protestants such as the Baily family, and supporting this number must have been difficult for most of the time. Baily's pleas to the Director General for promotion (and the resultant hoped for raise in salary) frequently alluded to his large family and the fact that some were suffering long-term illnesses, and the desire to maintain them in an adequate manner.

Little is actually known about the family. In a letter to Murchison dated 10th February 1866 Baily states that his eldest child (one of nine born by that time), a daughter, was aged 17 which would put her date of birth in about 1849. Then were born two more daughters: Charlotte (c. 1851) and Amy (December 1851 in Kensington). Another child, Henry William, who was born in London about March 1857, attended some meetings of the Royal Geological Society of Ireland with his father in 1875-77. Alfred Edward was born c. 1858 also in London like his older siblings. Edmund Oswin in 1861 was the first of Baily's children to be born in Dublin, and was followed by Rhoda Anne born in 1863, and Eleanor Frances in 1865. Edmund, Rhoda and Eleanor were baptised in Sandford Church of Ireland (http://churchrecords.irishgenealogy.ie). Another child was born in 1866 and two, including Annie (Daisy) the youngest after 1866.

Three of the children died young and are all buried in Mount Jerome Cemetery, Dublin with their parents: Amy Robina (Rebecca?) buried 7th January 1860 aged 8 years; Alfred Edward buried 1st February 1860 aged 1 year and 4 months, and Charlotte buried 23rd February 1872 aged twenty-one years. Edmund Oswin found employment in Dublin as a Railway Clerk (1911 Census returns), married Elizabeth, had two sons and two daughters, and he died in Dublin in July 1936. Rhoda married Alexander Coghill who was manager of the printing works of Eason & Sons. Their daughter was Rhoda Sinclair Coghill (1903-2000), an accomplished and well-known pianist and poet in Dublin. Four of Baily's adult daughters emigrated to Australia where they married (Rhoda Coghill, written communication to PNWJ 8th August 1993). Annie (who was also known as Daisy), married as his second wife Charles William Worboys at Penrith, New South Wales a town 43 miles west of Sydney, and had two sons one of whom died very young.

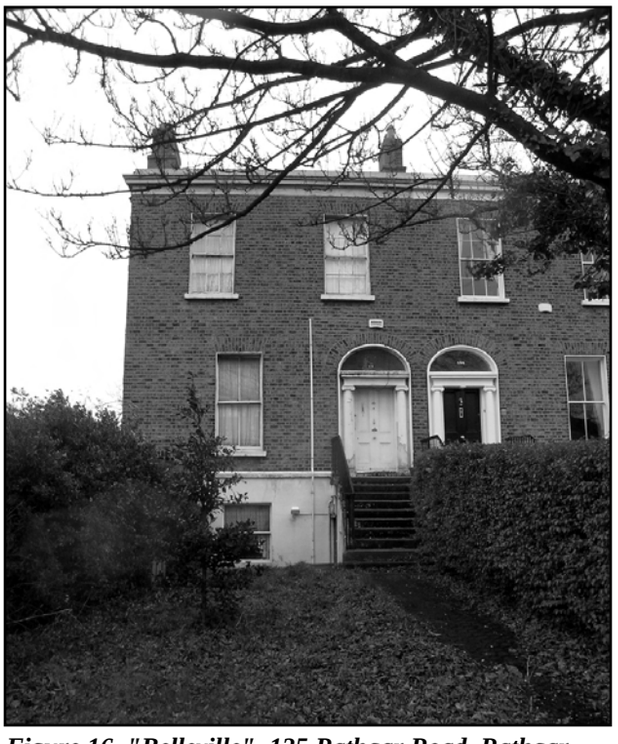


Figure 16. "Belleville", 135 Rathgar Road, Rathgar where Baily lived 1866-68.

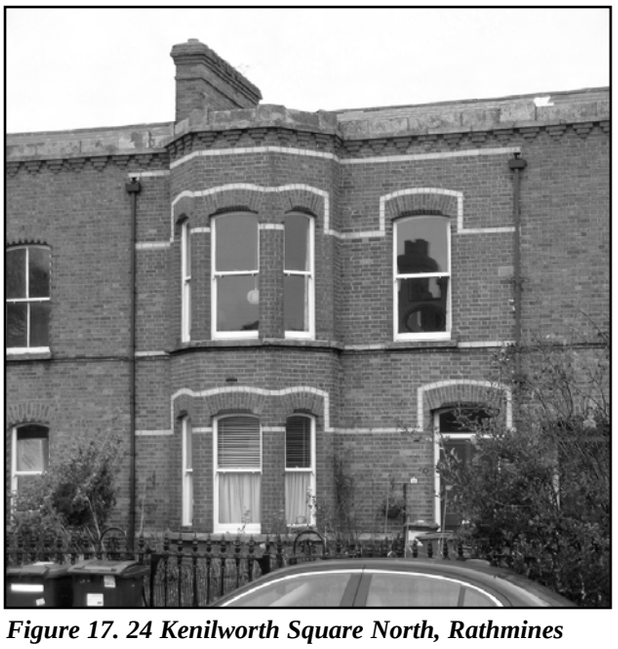


Figure 17. 24 Kenilworth Square North, Rathmines where Baily lived 1869-71.

Baily often cited family illnesses as reasons for his seeking promotion. He himself requested and was granted sick leave in June 1865 on account of suffering from the symptoms of 'lead disease' as his doctor attested (GSI letterbooks, 28th June 1865).

Baily and his family lived in a variety of locations in the Dublin suburbs of Ranelagh and Rathmines. These were among the several new townships built

Figure 18. "Apsley Lodge", 92 Rathgar Road, Rathgar where Baily lived 1872-81.

Figure 19. 3 Church Avenue, Rathmines where Baily died.

outside the city limits which were granted the privilege of local self-governance. The developers (many of whom also served as local councillors) who built Rathmines and Ranelagh south of the city ensured that local property taxes, known as 'Rates' were lower than the high levels charged by the city authorities (Ó Maithú 2003). Thus the area became popular with the professional middle classes of which Baily in his position would have regarded himself as being a part. The houses were well-constructed, large and generally were accompanied by a garden, which was in marked contrast with much of the property in the city. The townships were also easily accessible to Baily's place of work, being well served by trams and later a suburban rail-line.

Baily and his family moved fairly frequently:
1859-60: 5 Mountpleasant Road, Ranelagh;
1861-65: 17 Cullenswood Avenue, Ranelagh;
1866-68: "Belleville", 135 Rathgar Road, Rathgar (Figure 16);
1869-71: 24 Kenilworth Square North, Rathmines (Figure 17);
1872-81: "Apsley Lodge", 92 Rathgar Road, Rathgar (Figure 18);
1882-87: 33 Moyne Road, Ranelagh;
1888-death: 3 Church Avenue, Rathmines (Figure 19).

It is unlikely given the moderately short time of occupation of these houses that Baily owned any of them, but that he chose to rent the properties. This was not such an unusual practice at the time, with rental properties in the districts being quite plentiful. Examination of the Rateable Valuation of these properties (*Thom's Dublin Directories* 1859-1888) demonstrates that each move saw Baily and his family occupy a lower standard of housing. It has to be suspected that the moves were deliberate attempts to reduce the household expenditure, but were also allied to the reduction in the number of family members still within the household. Generally the size of later properties rented by Baily were smaller than those occupied between the 1860s and late 1870s. Undoubtedly, as his children married, most moved out. On William's death his son Edmund Oswin was listed in the 1889 *Thom's Directory* as the householder in 3 Church Avenue but the following year he himself had moved with his own family to the less salubrious area of Clondalkin. He later married and had four children, two boys and two girls (1911 census).

Baily's death

Sadly little is available to indicate much about the latter stages of his life. He was one of two plaintiffs (the other was a William J. Wilkinson, a Dublin Unionist) involved in legal proceedings taken in about late 1885 against Arabella Spencer and others in relation to the estate of her father John Spencer, a Dublin Scientific Instrument Maker. Spencer had died 2nd March 1885. As a result all the effects and fittings of Spencer's business at 23 Nassau Street were auctioned off over several days in late March and early April 1886 (*Irish Times* 31st March 1886; 1st, 3rd, 6th April 1886). How Baily benefited from

this sale we do not know. At much the same time the ownership of Spencer's burial plot at Mount Jerome Cemetery was passed to Baily (Niall MacCaughey, personal communication Dec 2009). What caused this action to take place in the first place we have been unable to ascertain.

The GSI archive guardbooks of letters received, and letterbooks of outgoing letters during 1887 to 1890 record Baily's request for three months sick leave on 8th March 1888 which was accompanied by a letter from his doctor. This referred to threatened dropsical attacks, which in modern medical terminology is oedema, an accumulation of fluids in body organs. A week later this leave was granted. On 14th June 1888 Baily applied for an extension of another three months and his doctor stated that although his health was improving he was still far from able to resume his work. Again the leave was granted but in doing so the Director General of the Geological Survey Archibald Geikie wondered whether the time had come for retirement to be considered. Baily never retired but died in service on 6th August 1888 when aged 69. How Baily would have taken enforced retirement we shall never know but perhaps he may have viewed it as simply not an option for a man to whom his salary always seemed inadequate.

He was buried on the morning of 8th August in Mount Jerome Cemetery in Harold's Cross, a suburb of Dublin adjacent to Rathmines. His wife who predeceased him a year earlier in February 1887 shares his grave in Grant ('Plot') 2654 in Sector 187/B1 and that of three of their children. Originally a Portland Stone headstone marked the grave but this has now disappeared. Mount Jerome was one of several large municipal cemeteries opened in Dublin in the 1830s once the city-centre graveyards had become full. It catered largely for the Protestant population and numbers among its notable internees the geologists Valentine Ball (1841-1895), Charles Oldham (died 1869) - both of the Geological Survey of India, Sir Richard Griffith, and John Joly (1857-1933) as well as the mineralogist James Apjohn (1796-1886), and medic John R. Kinahan (brother of Baily's colleague George of the GSI), who published early descriptions of the trace fossils in the Cambrian succession at Bray, Co. Wicklow.

What is surprising is that within the GSI his passing was barely commented on. No obituary is even bound into the GSI Guardbooks as it was for Jukes, even though in time a number were published in the press and in three scientific and geological journals (Appendix 4). Although 'lamented' by Hull and others, Baily's passing seems to have been quietly and without fuss. An estimate for the year 1890 in the letterbooks has a poignant blank space in the staff complement where Baily has been ghosted out. The GSI mapping was completed around this time, and Baily contributed Palaeontological Notes to the last of the memoirs not in metamorphic ground, from his home. Hull's Annual Report as Director for 1888 noted:

> "This memoir when published will make the numbers of those to which Mr Baily contributed Palaeontological Notes no fewer than 66. Little now remains to be done in Irish palaeontology except to add to the collections from time to time from new openings."

With this, Hull sounded a death knell for the palaeontological tradition of which Baily had been a key element for 44 years. Baily, the Acting-Palaeontologist was replaced, but not with another 'fossilist' but by a petrologist John Shearson Hyland (Herries Davies 1985, p. 105). Could it be that Baily's behaviour at times, his inability at other times to meet deadlines, and his continual attempts to get preferment simply tainted any possible future role of a palaeontologist in the Irish Office? While this may have been partially behind the decision, the GSI still had on its staff Alexander M'Henry (1843-1919) who served as Acting Assistant Palaeontologist to Baily for eight years (Herries Davies 1985: 315) and so this field was probably considered to be adequately covered.

The GSI collection history from 1890 up to 1924

Although the GSI had removed from 51 St Stephen's Green in 1869, the collections had remained on display there, with Baily and others having to make a trip around the street corner in order to examine specimens. It was not till 1890 that specimens were installed in the Dublin Museum of Science and Art. McHenry and Watts (1895) gave a conspectus of the collection, and so, with small modifications and some changes of gallery, it remained until 1924. Herries Davies (1995) best tells the story, but simply, the new government of Ireland after Independence wanted office space adjoining Leinster House and the entire GSI collections were crated up and put in storage.

The GSI fossil collection since 1924

Within an analysis of collecting in a post modern world, Pearce (1995: 140-141) argues that there is no reason why the meanings attached to collections in the past should continue to be attached to those same

things. Whilst this argument has a logical development and an attraction in its simplicity of application to the modern world of today, it somehow lacks a conviction when used in relation to the material culture of natural science collections. Materials such as the fossil collection handled by Baily, are not human fabrications. They are what they are - the preserved remains of once living creatures, produced by the random chance of natural processes. Thus we would argue that natural science collections are still relevant today with an integral meaning, whosoever is examining them, stored on a different shelf from the artefacts whose meaning is infinitely flexible.

The GSI has always been subject to periodic review. Despite the importance of geological survey work to society, it may be summarily axed. In that event, the fossil collection could come under threat. It may be perceived as costing money to store, without realising any income, and therefore be disposed of. The most likely scenario is that it would be offered to the National Museum of Ireland. In that case, the curated status and coherence as a discrete collection would probably be maintained. It is better to imagine that the 31 years of work Baily put into developing and documenting the collection would not be cast aside so lightly again.

Vale

In the obituary published in the *Geological Magazine* (Appendix 4) Baily is described as belonging to:

> "that small body of Geologists and Palaeontologists … who possessed an extensive general knowledge both of rocks and fossils, and also the invaluable ability to draw, as well as to describe, what they saw and studied, whether in the field or in the cabinet. These men can never be replaced by our modern student-specialists."

The author of the obituary above went on to state that "Mr. Baily was of a genial disposition", although given what Jukes said of him it is clear that he could be temperamental at times. While the problems that he encountered regarding his state, status and salary while employed in the service of the Geological Survey of Ireland may have caused him to be fractious and difficult at times, we feel some sympathy for his position in his never being accorded the title "Palaeontologist" having to endure the indignity of being the "Acting-Palaeontologist" for all of his Irish career. However, it is clear that considerable efforts were made by his colleagues to increase his salary by various means and that by 1868 he commanded an official income of £450 which was close to that of the Local Director of the Irish Branch of the Geological Survey. With a large family he naturally found it difficult to live within his means, and this caused him great anxiety, and this may have accounted for his truculent behaviour at times.

In recent years MAP has completed the curation of the GSI palaeontological collection to a usable condition and a type catalogue has been published (Parkes and Sleeman, 1997). Integral to the success of that work was the reliable nature of the original catalogues, almost entirely in the hand of Baily, and which proved to be the definitive source of information in the cases of subsequent confusion of information relating to specimens.

Equally Baily's other major portion of his scientific legacy lies in the major contributions that he made to the understanding of geology and palaeontology in Ireland. One cannot but be grateful for the many hours, days and weeks that he spent diligently describing, drawing, and lithographing fossils, and this attention to detail is best appreciated whenever one opens his beautiful book *Figures of Characteristic British Fossils*.

Acknowledgements

Over many years various people have generously provided very valuable material on Baily and his work and family in Dublin, as well as other useful information. His direct descendants Ossie Baily and Heather Baily of Dublin provided copies of some prints, as well as personal family information which otherwise would have proved difficult to obtain. The late Rhoda Coghill wrote to PNWJ telling him that a number of Baily's daughters had emigrated to Australia. Mike Crane (formerly of Bristol Museum) gave us information about Baily's employment in that city, while Mike Taylor discussed with us the role Baily played in the description of the Whitby plesiosaur. Peter Crowther, of the Geology Department, the Ulster Museum, originally compiled the information on the illustrations provided by Baily for various Palaeontographical Society Monographs. Tom Sharpe (National Museum and Galleries of Wales), kindly copied the items relating to Baily from within the De la Beche archives. Graham McKenna (formerly Librarian with the British Geological Survey Keyworth) located and copied Baily items from BGS archives. Mary Spencer Jones kindly tracked down Baily's work in Busk's catalogue of bryozoans. Frank McGarry of Mount Jerome Cemetery kindly checked the burial records and this allowed Baily's burial place to be located, while Robert Wyse Jackson tracked down some obscure law reports. Information on the Baily family

in Bristol was generously provided by Kieran Owens and also gleaned from the Baily Family Forum posted by Susan Scarcella on www.genforum.genealogy.com while that relating to John Spencer's grave was kindly provided by Niall MacCaughey. Other information was kindly provided, photographed or copied by Petra Coffey, Mike Simms, Ken James, Ann Scanlon and Adam Stuart Smith.

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Appendix 1 Papers published by William Hellier Baily

It must be noted that of these publications listed in Appendix 1.2, the exact date of publication is not always reliable since the paper could be read to a meeting in one year, but not appear for some years, or else be produced in an undated part of a volume that covered a span of several years.

1.1 Contributions to the British Association for the Advancement of Science

1855 On the occurrence of a true Cretaceous formation in the south of Africa, *Reports of the British Association for 1854*, (Liverpool), 83.

1857 On fossils from the Crimea, *Reports of the British Association for 1856*, (Cheltenham), 60.

1858 On Carboniferous limestone fossils from the county of Limerick, *Reports of the British Association for 1857*, (Dublin), 62-63.

1857 On a new fossil fern from the coal-measures near Glin, co. Limerick, *Reports of the British Association for 1857*, (Dublin), 63-64.

1859 On the Fructification of *Cyclopteris Hibernica*, Forbes, from the Upper Devonian or Lower Carboniferous strata at Kiltorkan Hill, county Kilkenny, *Reports of the British Association for 1858*, (Leeds), 75-76.

1859 On two new species of Crustacea (*Belinurus*) from the coal-measures in Queen's County, Ireland, and remarks on forms allied to them, *Reports of the British Association for 1858*, (Leeds), 76-77.

1860 On Tertiary fossils of India, *Reports of the British Association for 1859*, (Aberdeen), 97-98.

1860 On *Sphenopteris Hookeri*, a new Fossil Fern from the Upper Old Red Sandstone formation at Kiltorkan Hill, in the county of Kilkenny; with some observations upon the Fish-remains and other associated fossils from the same locality, *Reports of the British Association for 1859*, (Aberdeen), 98-99.

1862 Palaeontological remarks on Silurian rocks of Ireland, *Reports of the British Association for 1861*, (Manchester), 108.

1863 On a New Species of *Plesiosaurus* from the lias near Whitby, Yorkshire, *Reports of the British Association for 1862*, (Cambridge), 68-69.

1865 On some new points in the structure of *Palaechinus*, *Reports of the British Association for 1864*, (Bath), 49.

1865 On the occurrence of Fish-remains in the Old Red Sandstone at Portishead, near Bristol, *Reports of the British Association for 1864*, (Bath), 49-50.

1869 Notes on the fossils from the Old Red Sandstone of Kiltorcan Hill, Co. Kilkenny, *Reports of the British Association for 1868*, (Norwich), 58-59.

1870 Report on fossils obtained at Kiltorcan Quarry, Co. Kilkenny. *Reports of the British Association for 1869*, (Exeter), 73-75.

1876 Description of a new species of Labyrinthodont Amphibian from the Coal at Jarrow Colliery, near Castlecomer, Kilkenny, *Reports of the British Association for 1868*, (Bristol), 62-63.

1879 Notice of some additional Labyrinthodont Amphibians and Fish from the Coal of Jarrow Colliery, near Castlecomer, county of Kilkenny, Ireland, *Reports of the British Association for 1878*, (Dublin), 530.

1879 On some new species of Irish fossils, *Reports of the British Association for 1878*, (Dublin), 535.

1880 Report of the Committee appointed for the purpose of Collecting and Reporting on the Tertiary (Miocene)

Flora, etc., of the Basalt of the North of Ireland, *Reports of the British Association for 1879*, (Sheffield), 162-164.

1881 Second Report of the Committee appointed for the purpose of Collecting and Reporting on the Tertiary (Miocene) Flora, etc., of the Basalt of the North of Ireland, *Reports of the British Association for 1880*, (Swansea), 107-109, 2 plates.

1882 Third Report of the Committee appointed for the purpose of Collecting and Reporting on the Tertiary (Miocene) Flora, etc., of the Basalt of the North of Ireland, *Reports of the British Association for 1881*, (York), 152-154, 2 plates.

1884 Fourth Report of the Committee appointed for the purpose of Collecting and Reporting on the Tertiary (Miocene) Flora, etc., of the Basalt of the North of Ireland, *Reports of the British Association for 1883*, (Southport), 209-210, 1 plate.

1884 Some additional notes on *Anthracosaurus Edgei* Baily sp., a large sauro-bactrachian from the Lower Coal Measures, Jarrow Colliery, near Castlecomer, Co. Kilkenny, *Reports of the British Association for 1883*, (Southport), 496-497.

1.2 Books and Papers published in scientific journals

Description of some Cretaceous Fossils from South Africa, collected by Captain Garden, *Quarterly Journal of the Geological Society* **11** (1855), 454-465.

On a Crustacean from the Coal Measures, with some remarks on the genus *Limulus*, *Journal of the Geological Society of Dublin* **8** (1857-60), 89-91; *Natural History Review* **5** (1858), 168-171.

Description of Fossil Invertebrata from the Crimea, *Quarterly Journal of the Geological Society* **14** (1858), 133-163. Baily also published a letter on this subject in the *London Illustrated News* early in 1856.

On fossils from the Crimea, with descriptions of some new species, principally in the Collection of the Royal Dublin Society. *Journal of the Royal Dublin Society* **2** (1858-9), 233-240.

On fossils from the Crimea, *Natural History Review* **5** (1859), 191-198.

Notice of Upper Silurian Fossils from Ballycar South, county of Clare, *Journal of the Geological Society of Dublin* **8** (1857-60), 109-110; *Natural History Review* **6** (1858), 72-73.

On Fossil Localities near Drogheda, *Journal of the Geological Society of Dublin* **8** (1857-60), 120-125.

On the occurrence of detached plates of the shell of a new species of Chiton in the Carboniferous Limestone at Lisbane, county of Limerick, *Natural History Review* **6** (1859), 330-334; *Journal of the Geological Society of Dublin* **8** (1860), 167-171.

Observations on two new species of Chiton from the Upper Silurian 'Wenlock Limestone' of Dudley, *Annals and Magazine of Natural History* **6** (1860), 91-98.

On a new species of Pentacrinite from the Oxford Clay, Weymouth, Dorsetshire, *Dublin Zoological and Botanical Association Proceedings* **2** (1860), 19-23; *Annals and Magazine of Natural History* **6** (1860), 25-28; *Natural History Review* **7** (1860), 418-421.

On fossil Chitonidae and their distribution in geological time, *Dublin Zoological and Botanical Association Proceedings* **2** (1860), 40-47.

On a new species of *Solarium* from the Upper Greensand near Dorchester, *Dublin Zoological and Botanical Association Proceedings* **2** (1860), 66-67; *Annals and Magazine of Natural History* **6** (1860), 28; *Natural History Review* **7** (1860), 444.

On *Corynepteris*, a new generic form of Fossil Fern; with observations on the associated plants from the Coal-measures of Glin, county of Limerick, *Journal of the Geological Society of Dublin* **8** (1857-60), 237-241; *Natural History Review* **7** (1860), 258-262.

On the occurrence of some characteristic Graptolites and other fossils, indicating certain divisions of the Lower Silurian rocks in the counties of Meath, Tipperary and Clare, *Journal of the Geological Society of Dublin* **9** (1860-62), 300-306.

Remarks on some Coal-Measure Crustacea belonging to the genus *Belinurus*, König, with descriptions of two new species from Queen's County, Ireland. *Proceedings of the Dublin University Zoological and Botanical Association* **3** (1862), 88-96, pl. 4.

Description of a new species of *Plesiosaurus*, from the Lias, near Whitby, Yorkshire, *Journal of the Royal Dublin Society* **4** (1863), 160-170. (Co-authored with Carte, A.)

On two new species of Crustacea (*Belinurus*, Koenig), from the Coal-measures in Queen's County, Ireland; and some remarks on forms allied to them, *Annals and Magazine of Natural History* **11** (1863), 107-114.

Notes on the fossils collected by Mr Wynne in the counties of Sligo and Leitrim, *Journal of the Geological Society of Dublin*, 10 (1864), 40-41.

On the occurrence of Fish-remains in the Old Red Sandstone at Portishead, near Bristol, *Geological Magazine* **1** (1864), 293.

On some new points in the structure of Palaechinus, Geological Magazine, 2 (1865), 44-45. Also *Journal of the Royal Geological Society of Ireland* **1** (1865), 63-65.

Some additional notes the structure of Palaechinus, *Journal of the Royal Geological Society of Ireland* **1** (1865), 65-67.

The Cambrian rocks of the British Islands, with especial reference to the occurrence of this formation and its fossils in Ireland, *Geological Magazine* **2** (1865), 385-400.

The recent discovery of fossil reptiles in the Coal of the south of Ireland, *Geological Magazine* **3** (1865), 84-86.

On Salter's Appendix to vol. iii of the Memoirs of the Geological Survey of Great Britain, *Geological Magazine* **3** (1866), 477-478.

Figures of Characteristic British Fossils: with Descriptive Remarks, volume 1, Palaeozoic, with 42 plates and 18 woodcuts. 8vo, pp.126. London (Van Voorst). [Parts 1-4. Part 1, pp. 1-30, 1867; Part 2, pp. 31-61, 1869; Part 3, pp. 62-92, 1871; Part 4, pp. i-lxxx, 93-126, 1875]

Notice of Plant-remains from beds interstratified with the Basalt in the county of Antrim, *Quarterly Journal of*

the Geological Society **25** (1869), 162.

Notes on Graptolites and allied Fossils occurring in Ireland, *Quarterly Journal of the Geological Society* **25** (1869), 158-162.

On the Fossils of the Ballycastle Coal-field, Co. Antrim, *Journal of the Royal Geological Society of Ireland* **2** (1871), 270-275.

Remarks on the Genus Pleurorhynchus, with a description of a new species, *Journal of the Royal Geological Society of Ireland* **3** (1871), 24-25.

Additional Notes on the Fossil Flora of Ireland. On Filicites plumiformis, n.s., from the Carboniferous Limestone near Wexford, *Journal of the Royal Geological Society of Ireland* **3** (1872), 48-51.

The Kiltorcan fossils. *Nature* **5** (1872), 224-225.

Sketch of the Geology of Belfast and the Neighbourhood, *Hardwicke's Science Gossip* **116** (1874), 169-170.

Remarks on the Palaeozoic Echinida: *Palaechinus* and *Archaeocidaris*, *Journal of the Royal Geological Society of Ireland* **4** (1877), 40-43 (2 plates).

On Fossils from the Upper Old Red Sandstone of Kiltorkan Hill, in the county of Kilkenny, Report No. 1, *Proceedings of the Royal Irish Academy,* second series, **2** (1877), 45-48.

Lists of Fossils. *In* Kinahan, G.H. 1878. *A manual of the geology of Ireland*. C. Kegan Paul & Co., London, xx+444 pp.

Sketch of the Geology of Dublin and Wicklow, *Hardwicke's Science Gossip* **164** (1878), 179-183.

Palaeontology of County Dublin, pp. 48-72. *In* Macalister, A. and M'Nab, W.R. (eds) *Guide to the County of Dublin: its Geology, Industries, Flora, and Fauna*. Hodges, Foster & Figgis, Dublin (1878), pp. vii+219; 1-100.

On the Palaeontology of County Dublin, *Journal of the Royal Geological Society of Ireland* 15 (1880), 78-98. Also published in the *Scientific Proceedings of the Royal Dublin Society* **1** (1880), 162-182.

Report on the Rocks of the Fintona and Curlew Mountain Districts (jointly with G.H. Kinahan, M.R.I.A.), *Proceedings of the Royal Irish Academy* (1880), **3**.

On Trilobites and other fossils from Lower and Cambro-Silurian strata, in the county of Clare, Scientific Proceedings of the Royal Dublin Society, 4 (1885), 373. Also published in *Journal of the Royal Geological Society of Ireland* **7** (1886), 29.

On a new species of *Orophocrinus* (*Pentremites*), in Carboniferous Limestone, county Dublin; also remarks upon *Codaster trilobatus* (M'Coy) from Carboniferous Limestone, County Kilkenny, *Scientific Proceedings of the Royal Dublin Society* **5** (1886), 31-33. Also published in *Journal of the Royal Geological Society of Ireland* **7** (1886), 71-73.

Rambles on the Irish Coast, especially relating to its Geology, Natural History and Antiquities. Sealy, Bryers and Walker, Dublin (1887), 69pp, handcoloured map and ten woodcuts. This was reprinted in paperback in a slightly enlarged format by Carrig Books, Blackrock, Co. Dublin in 1975.

Appendix 2 Fossil illustrations by W.H. Baily

2.1 Memoirs of the Geological Survey of the United Kingdom. Figures and descriptions illustrative of British Organic Remains

Decade 1 (1849)	
Plate 5, figs 1-10	*Salenia personate* Defrance, 1825
Plate 6, figs 1-12	*Echinus granulosus* Munster
Plate 7, figs 1-9	*Galerites* (*Discoidea*) *subuculus* Leske
Plate 8, figs 1-9	*Galerites* (*Discoidea*) *cylindrica* Lamarck
Plate 10, figs 1-8	*Nucleolites* (*Catopygus*) *carinatus* Munster
Decade 2 (1849)	
Plate 1, figs 1-16	*Phacops* (*Dalmannia*) *caudatus* (Brunnich, 1781)
Plate 2, figs 1-8	*Illaenus davisii* Salter
Plate 3, figs 1-3	*Illaenus* (*Bumastus*) *barriensis* Murchison
Plate 4, figs 1-9	*Illaenus* (*Bumastus*) *barriensis* Murchison
Plate 10, figs 1-5	*Ampyx nudus* Murchison
Decade 3 (1850)	
Plate 4, figs 1-11	*Hemicidaris intermedia* (Fleming, 1828)
Plate 5, figs 1-4 [Plate 8?]	*Hemicidaris purbeckensis* Forbes, 1850
Decade 4 (1852)	No plates by Baily.
Decade 5 (1856)	[Plate 10?]
Decade 6 (1852)	No plates by Baily.
Decade 7 (1853)	[Plate 1?]
Plate 2, figs 1-15 [Plate 3?]	*Cheirurus bimucronatus* (Murchison, 1839)
Plate 9, figs. 1-7	*Cyphoniscus socialis* Salter, 1852

2.2 Memoirs of the Geological Survey of Ireland

We have identified Baily's illustrations by reference to initials or signature included on woodcut or lithograph, or where unsigned by style. Many were reused in specific area memoirs such as the Leinster Coalfield, and in revised versions. Others without attribution may also have been drawn by Baily.

Memoir to Sheets and Page Number of Figure:

7, 8

p. 47 *Sphenopteris flabellata* Baily. Initials

49, 50, 61

p. 23 Graptolites. Initials.

54, 42

p. 22 *Solemya symesii* Baily. Initials.

70

p. 18 *Archaeocidaris stelliffera* Baily. Initials. (W.H. By.).

119

p. 9 *Crania catenulata* Salter ms; Trochus fucatus Baily.

p. 10 *Turbo rupestris* (Eichwald); *Euomphalus tubaeformis* Baily.

120, 121

p. 17 *Oldhamia antiqua* (Forbes). Initials.

p. 18 *Oldhamia radiata* (Forbes). Initials.

p. 19 Cambrian traces. Initials.

p. 20 *Histioderma hibernica* Kinahan. Initials.

p. 21 *Histioderma hibernica* Kinahan. Initials.

127

p. 8 Plants. Initials

p. 9 Namurian bivalves. Initials

p. 12 *Orodus ramosus*. Initials

128
p. 14 Queen's County Namurian slab with traces. Signature.
p. 16 Queen's County Namurian slab with traces. Signature.
133
p. 10 Trilobites. Initials
p. 11 Graptolites. Initials
p. 12 Graptolites and *Theca cometoides* Baily (pteropod). Initials
p.13 *Ceratiocaris* (Crustacean)
140, 141
p. 9 Slab of Liscannor flagstone. Signature
142
p. 12 *Goniatites crenistria*. Initials
p. 13 *Orthoceras minimum* Baily; *Myalina foynesiana* Baily; *Loxonema galvani* Baily. Initials
p. 14 *Macrocheilus inflatus* Baily. Initials
p. 15 *Loxonema minutissima* Baily. Initials
p. 17 *Corynepteris stellata* Baily. Signature
p. 19 *Lunulacardium footii* Baily; Fish Scales. Initials
143
p. 11 *Petraia dunoyeri* Baily. Signature
145
p. 10 *Actinocrinus wynnei* Baily. Signature
p. 11 *Orthoceras elongato-cinctum*? Initials
p. 11 *Pleurorhynchus* (*Conocardium*) *calcis* Baily. Signature
147, 157
p. 14 *Adiantites hibernicus* Forbes. Initials.
p. 15 *Sphenopteris hookerii* Baily. Initials reversed.
p. 16 *Anodonta jukesii* Forbes. Initials.
p. 17 Fish fragments. Initials
158, 159
p. 40 *Triarthrus becki* (Green). Initials reversed.
169, 170, 180, 181
p. 59 *Palasterina kinahani* Baily. Initials.
187, 195, 196
p. 19 *Sphenopteris* sp. Initials (in part, also with initials CMG - probably C. Grey, Engraver).
p. 20 *Filicites lineatus* Initials
p. 22 *Sagenaria veltheimiana* Initials (in part, also CMG)
p. 24 *Cyathophyllum celticum* Lonsdale. Initials
p. 25 *Pleurodictyum problematicum* Initials (in part, also CMG)
p. 28 *Curtonotus Initials* (in part, also CMG)
p. 30 Protaster sp. Initials
192, 199
p. 20 Plant Initials (in part, also CMG)
p. 21 *Cyrtina heteroclita*? *Producta*? new species *Athyris*? new species Initials
p. 22 *Cucullaea griffithi* Salter Initials
p. 23 *Nucula* spp. *Axinus* sp? *Orthoceras undulatum* Initials
p. 24 *Actinocrinus triacontadactylus* Initials (in part, also CMG)
p. 25 ?*Platycrinus* (*Adelocrinus*) *hystrix* Phillips *Platycrinus laevis*? Initials (in part, also CMG)

2.3 Monographs of the Palaeontographical Society

Peter Crowther (Head of Natural Sciences at the Ulster Museum) has undertaken extensive research into the various artists involved in illustrating these important palaeontological publications. His manuscript notes on W.H. Baily, refer to four monographs, completed whilst at the Geological Survey of Great Britain in London. Charles Bone, who was a fellow draughtsman and Baily's colleague during the late 1840s and 1850s also contributed plates published in a number of other monographs.

Forbes, E. 1852. *Monograph of the Echinodermata of the British Tertiaries*.
Wright, T. 1852-78. *Monograph of the British fossil Echinodermata of the the Oolitic Formations*.
Morris, J. and Lycett, J. 1851 (for 1850). *A monograph of the Mollusca from the Great Oolite*, Part I.
Morris, J. and Lycett, J. 1853. *A monograph of the Mollusca from the Great Oolite*, Part II

2.4 Other publications

Baily's contribution to the work of others was most often as illustrator of important fossils, but in many cases simple verification or support of palaeontological judgements or opinions was sufficient and his name was cited as establishing the credibility of the work. Below are listed in date order those papers in which Baily received acknowledgement for assistance or else provided lithographed illustrations. Those publications marked § have not been seen or Baily's contributions verified by us. These are listed as containing Baily illustrations by Nissen (1969).

§Lithograph of *Alcyonium poculum* (Neptune's Cup), London, undated. *Field Magazine*. This unusual coral from Singapore was discussed in Bree (1868).

Forbes, E. 1845. Report on the Fossil Invertebrata from Southern India, collected by Mr. Kaye and Mr. Cunliffe. *Transactions of the Geological Society*, Series 2, **7**, 97-174.

Falconer, H. and Cautley, P.T. 1846-9. *Fauna antiqua Sivalensis*. London. W.H. Bailey is named only on Plate 84 in a bound volume of plates in NMI geology library, amongst 12 artists supervised by G.H. Ford in the publication series.

Forbes, E. 1848. *A monograph of the British naked eyed medusae*. Ray Society, London.

Busk, G. 1854. *Catalogue of marine Polyzoa in the collection of the British Museum*. Part 3. Cheilostomata (part). British Museum (Natural History), London, pp. viii, 55-120, pls. 69-124. Baily was responsible for engraving eleven plates, numbers 71, 74, 76, 77, 92, 97, 98, 99, 114, 115 and 116.

Wright, T. 1855. On Fossil Echinoderms from the Island of Malta; with Notes on the stratigraphical distribution of the Fossil Organisms in the Maltese Beds, *Annals and Magazine of Natural History*, Series 2, **15**, 101-127; 175-196; 262-276, plates 4-7. Baily drew and engraved plates 4 and 7 while his colleague Charles Bone prepared the other two (see Zammit Maempel, G. 2007: 40-42 for further details and a reproduction of Baily's plate 4).

King, W. 1857. On the occurrence of Permian Magnesian Limestone at Tullycooel, near Artrea, in the county of

Tyrone. *Journal of the Geological Society of Dublin* **7**, 67-81. Plate drawn by William King junior (later Superintendent of the Geological Survey of India) and lithographed by Baily.

Waller, E. 1860. On the discovery in Ireland of new shells. *Journal of the Royal Dublin Society* **2**, 29-34. Baily drew the plate figures.

Haughton, S. 1860. On a rare form of one of the Carboniferous nautiloids found at Cleenish, County of Fermanagh. *Journal of the Royal Dublin Society* **2**, 357-358. Plate drawn and lithographed by Baily.

Jukes, J.B. and Du Noyer, G.V. 1860. On the geological structure of Caherconree Mountain, ten miles west of Tralee. *Journal of the Geological Society of Dublin* **8**, 106-109. Lists of fossils determined by Baily.

Foot, F.J. 1860. Notice of some new localities for Posidonomya near Ennis, County of Clare. *Journal of the Geological Society of Dublin* **8**, 115-116. Baily provided a lengthy note.

Jukes, J.B. 1862. *Student's Manual of Geology*. A. & C. Black,, Edinburgh, xix+764 pp. This is the second edition which was augmented with lists of fossils and illustrations by Baily. [3rd edition, 1872 partially rewritten by Archibald Geikie].

Jukes, J.B. 1863. *School Manual of Geology*. A. & C. Black, Edinburgh, xiii+362 pp. [The 5th and 6th editions were edited by Jukes' nephew, the geologist A.J. Jukes-Browne].

Noble, E.St. G. 1862. Analysis of the crinoidal limestone from Newtown Quarry, Athboy, Co. Meath. *Journal of the Royal Dublin Society* **3**, 133-134. Two bivalve species identified. "I am indebted to Mr. Baily for this short description of the fossiliferous character of the rock."

Adams, A.L. 1863. Observations on the fossiliferous caves of Malta. *Journal of the Royal Dublin Society* **4**, 11-19. Baily provided illustrations of two new species.

Jukes, J.B. 1865. Notes for a comparison between the rocks of the south-west of Ireland and those of North Devon, and of Rhenish Prussia (in the neighbourhood of Coblentz). *Journal of the Royal Geological Society of Ireland* **1**, 103-138. "In my drawing up this comparative list I have been advised and assisted by my colleague, Mr W.H. Baily; for without a professed palaeontologists to appeal to, it would be impossible to avoid mistakes."

§Salter, J.W. and Blandford, H.F. 1865. *Palaeontology of Niti, in the northern Himilaya, being descriptions and figures of the Palaeozoic and Secondary fossils collected by Col. R. Strachey*. Calcutta.

Hull, E. 1871. On the geological age of the Ballycastle Coal-field and its relations to the Carboniferous rocks of the west of Scotland. With Palaeontological Notes by W.H. Baily. *Journal of the Royal Geological Society of Ireland* **2**, 260-275. The notes constitute an Appendix from page 270-275 and possibly a plate, i.e. one third of the paper.

Kinahan, G.H. 1878. *A manual of the geology of Ireland*. C. Kegan Paul & Co., London, xx+444 pp.

Davis, J.W. 1883. On the fossil fishes of the Carboniferous limestone Series of Great Britain. *Scientific Transactions of the Royal Dublin Society* **1** (Series 2), 327-550 (Plates 43-48).

Appendix 3 Obituary notices of William Hellier Baily

Geological Magazine 25(9) (1888), 431-432; 575-576.
Nature (23rd August 1888), 396.
Proceedings of the Geological Society 45 (1889), 39-41.

Appendix 4 Archive holdings of Baily material or correspondence

British Geological Survey:
Songs sung at Royal Hammers Annual Dinners (GSM1/146).
Photographic portrait 1863 (GSM1/639).
Letter from A.C. Ramsay (GSM1/420).
Letters to Baily (GSM1/7, p. 91, 94, 416; GSM1/8, p. 27, 321, 468, 480, 482, 493, 548; GSM1/9, p. 21; GSM1/16, p. 168).
Letters from Baily (GSM1/9, p. 147, 152, 210, 237, 238, 251-2, 280-2; GSM1/18, p. 62; GSM1/26, p. 100; GSM1/38, p. 163).
Geological Survey of Ireland:
Drawings; Painting of Sutton, Co. Dublin; Proofs of *Characteristic Fossils*.
National Library of Ireland:
Drawings.
National Museum of Ireland:
Manuscript listing of large collection of British fossils sent to Dublin by Geological Survey in London - see GSUK file in Beggars Bush NMI library
University of Cambridge:
Letters to Charles Darwin.
University College, Dublin, School of History and Archives http://hdl.handle.net/10151/OB_0001008_AR LA41/90):
Letter to Baily from Joseph Wright on *Palaechinus*, 25/--/1864, LA41/13.
Letter to Baily from F.W. Rudler, 3rd February 1883; UCD archives LA41/90.
University of Edinburgh:
Four letters to Archibald Geikie.
University of Oxford:
Drawing of 'Fault in the Iguanodon Quarry Maidstone W.H.B.'. Facsimile wrongly attributed to William Buckland when included in Dorling Kindersley Action Pack *Dinosaur* 2003.

LEOPOLD McCLINTOCK - 'ARCTIC FOX' AND HIS NATURAL SCIENCE COLLECTIONS.

by N.T. Monaghan

Monaghan, N.T. 2009. Leopold McClintock - 'Arctic Fox' and his natural science collections. *The Geological Curator* 9 (2): 85 - 92.

Admiral Sir Francis Leopold McClintock from Dundalk, Co. Louth gained fame and rank through his exploits in the Royal Navy during expeditions inside the Arctic Circle in Northern Canada in search of the missing expedition of Sir John Franklin. During voyages in the 1840s and 1850s McClintock perfected sledging techniques that allowed for long trips, far from the safety of the ship. He collected geological 'waistcoat pocket' sized specimens and helped to produce one of the first bedrock maps of the area around the Northwest Passage. McClintock's fossils were described by Samuel Haughton and Oswald Heer. They included Tertiary plants that show a warm polar region before the ice cap developed and Jurassic ammonites that caused a stir in the 1860s with the suggestion of warmer waters at the poles in the past. McClintock brought his collections back to the Royal Dublin Society museum where they now form part of the National Museum of Ireland collections. In addition to geological specimens, he brought a polar bear and two musk oxen that have been on exhibition longer that the current museum building has been in existence. For over 150 years McClintock has been famous as the man who put the bullet hole in the polar bear seen by generations of Irish visitors to the 'dead zoo'.

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Introduction

The loss of a major British expeditionary force of 139 men in search of the Northwest Passage in 1845 caused a sensation at the time. The ill-fated Franklin expedition has filled the popular non-fiction shelves of generations of bookshops and libraries as well as featuring in almost every book on polar exploration (Owen 1978). The cautionary tale stems from the attempt in 1845 to locate the mythical connection over northern North America to the rich trading areas of western USA and the Pacific at a time when the alternative was a perilous and costly sail around Cape Horn. The man credited with the discovery of the fate of the Franklin expedition was an Irishman, Leopold McClintock (1819-1907).

Described as a small blue-eyed character with a sunny good temper. He had left his home in Dundalk, Co. Louth for a life of adventure, partly to avoid studying Latin as the family legend has it. Leopold was a cabin boy on the *Samarang* at the age of 12 when he was weighed against a Newfoundland dog and found to be only 2 lb heavier. Never of imposing stature, he made a significant impact however on those who encountered him throughout his naval career (Markham 1909, Lenz 2003, Murphy 2004).

By 1848 McClintock was a Lieutenant on the *Enterprise* under Sir James Clark Ross who had discovered the North magnetic pole. Accompanied by the *Investigator* with Captain Bird and Lieutenant McClure, their expedition set out on foot on 15/5/1849 from the winter base at Port Leopold. Ross walked ahead of McClintock's party of six-man sledges exploring the coast from Cape Bunny to Cape Bird. A trip of 800 kilometres carried out in thirty-nine days. They reached Peel Sound but failed to discover Bellot Strait. All but McClintock returned to the ship with scurvy. The ships were trapped in ice in Lancaster Sound and travelled 400 kilometres in a month before being released on 25/9/1849 and sailing home, arriving on 5/11/1849.

In 1851 McClintock with his sledge *Perseverance* made an amazing journey of 1240 km around Parry's Winter Harbour, a record in its day. It took eighty days to travel from winter base at Griffith Island to Melville Island and back. These long journeys were made possible by McClintock's technique of bringing a large sledge hauled by an eight-man team and making forays with a lighter sledge. He also developed the technique of sending parties to lay provi-

Figure 1. McClintock's camp at Transition Valley, named after the junction of limestone and sandstone. By Lieutenant Browne RN, in McClintock 1857.

sions along the route. Fifty years later, polar explorers including another Irishman Ernest Shackleton (1874-1922) were still visiting McClintock to learn his techniques at first hand. In all, about a hundred sledging parties from the Royal Navy covered 65,000 kilometres in the Franklin search. The combined scientific wisdom of McClintock's generation of Arctic explorers was assembled in 1875 by the Royal Society in London for the benefit of a proposed Royal Navy expedition to the geographic North Pole (Jones 1875). It ran to over 780 pages and is a fascinating and insightful summary of the state of scientific knowledge of its time, including advice on the collection of geological specimens and appropriate field observations and measurements of benefit to geologists.

Figure 2. Leopold McClintock in Arctic clothing.

Arctic expeditions at that time were as much a scientific survey as a search for the expedition under Sir John Franklin. Officers kept a log of all game shot and animals encountered, the idea being that they were to assess the possibility of living off the land. The paucity of encounters with wildlife on McClintock's inland sledging trips indicated an absolute reliance on supplies brought from the mother ship. Seals and birds were common enough around the coasts but the pack ice and barren islands had little to offer. Even where animals were encountered and eaten this only supplied meat, not a balanced diet and one with various adverse digestive consequences!

Figure 3. Musk ox calf shot by McClintock's party and eaten. **Ovibos moschatus** ***NMINH:2007.47.7.***

In addition to taking astronomical, geodetic and atmospheric measurements McClintock's party collected natural history specimens that are now in museums. The family inherited various items from the Franklin expedition discovered by McClintock and his clothing survives in the National Maritime Museum at Greenwich, London. The National Museum of Ireland has McClintock's geological and zoological collections along with those from other Irish Arctic explorers of his generation.

McClintock's natural science collections were donated by him to the Royal Dublin Society (RDS). He read two papers to the society on 25/1/1856 and 27/5/1856 which were compiled in a paper published in their journal of January-April 1857 supported with geological notes by Rev. Samuel Haughton (1821-

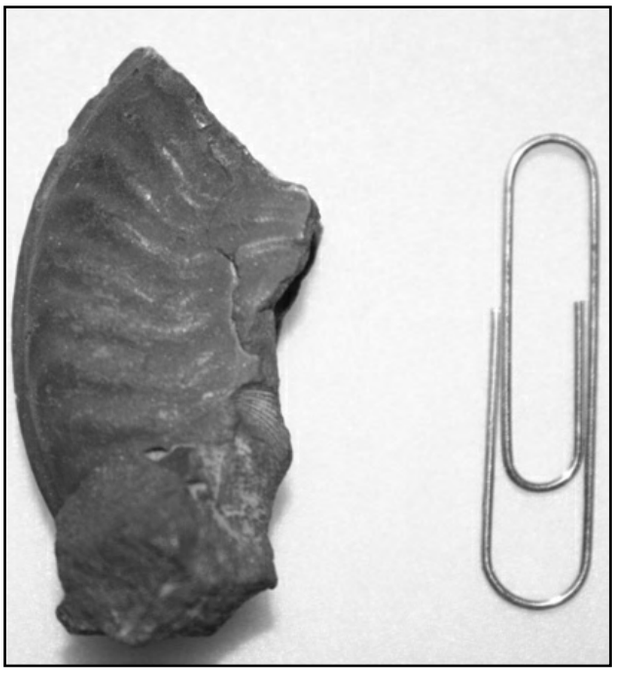

Figure 8. Jurassic (Lower Bajocian) ammonite* Pseudolioceras macclinctocki *(Haughton 1857) NMING:F16436.

1897), Professor of Geology in Trinity College Dublin (McClintock 1857). In this account of his travels he describes his geologising as the collection of 'waistcoat pocket' specimens. This is borne out by the small size of the samples now in the National Museum of Ireland, which inherited the RDS collections in 1877 (Monaghan 1992). The weights involved dictated that samples had to be of minimal size when collected on sledging trips. There are interesting parallels with modern space travel where resources are tight and payloads critical. As McClintock noted there is '…no amount of scientific knowledge so small that it may not be turned to some practical advantage' (in Haughton 1860b).

The palaeontology and geology uncovered by McClintock's explorations were published by Haughton. From McClintock's writings it is clear that he personally had a good general knowledge of the types of specimens he was collecting. McClintock has field descriptions of various rock types and minerals including 'fibrous gypsum' and 'selenite' indicating that although he may have left school at an early age his education had benefited from his time as a naval officer. The geological map published to accompany his 1857 paper shows extensive outcrop of Silurian rocks that were '…similar to the Dudley limestone, and would strike even an observer who was not a geologist.' extending the comparison to cliff profiles where he noted '…unequal weathering of the cliff, which causes the hard limestone to stand out in bands.'

The geological map by Haughton accompanying McClintock's paper identifies lower Carboniferous sandstones with coal-bearing bands. Coal was a significant discovery. It could be used as a fuel for fires to provide heat to the sailors or for cooking, but also had the potential to provide fuel to power steam vessels. Franklin's expedition had ships fitted with steam engines for propulsion, amongst the first in the fleet. The map of 1857 indicated 'granitic and gneissoid' rocks and demarcated 'Liassic Beds' extending as far east as Greenland that were to provide significant interest on the palaeontological front.

Haughton described a number of new species of fossils in the 1857 paper and added a second article a few years later (Haughton 1860a). He published the invertebrates, some ascribed to well known species, others considered new and named by Haughton. Included in Haughton's new species was *Ammonites M'Clintocki* Haughton, now *Pseudolioceras macclinctocki* (Haughton 1857) (in Frebold 1957). The occurrence of such an animal in the polar regions at 76 degrees north puzzled Haughton as he lived at a time long before our modern understanding of the polar ice caps as a Quaternary rather than a Jurassic phenomenon. In Haughton's words '…it appears to me difficult to imagine the possibility of such a fossil living in a frozen, or even a temperate sea.' (Haughton 1857). He appears almost relieved to record later that others confirmed his supposition that the fossil was indeed Jurassic (Haughton 1887).

McClintock managed to return home safely with only a fraction of his original field specimens. He was forced to abandon a significant collection on Melville Island some three day's march from Bridport Inlet. The weather had warmed up, leading to a flooded surface above the permafrost and the wheeled cart laden with collections was simply to

Figure 5. Model of The Fox in silver, presented to McClintock by Lady Franklin.

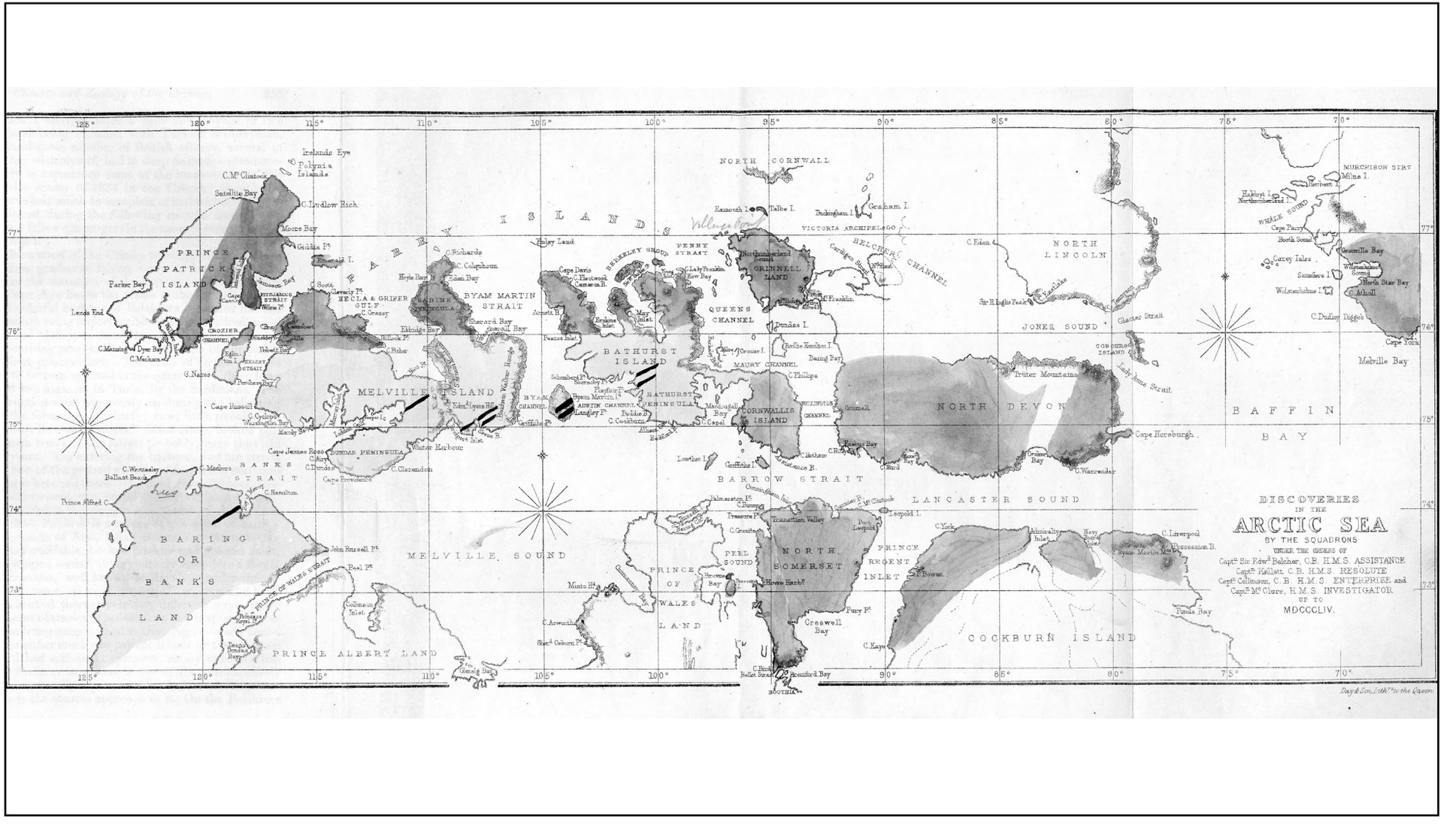

Figure 6. Map of the bedrock geology of the area explored by McClintock up to 1857.

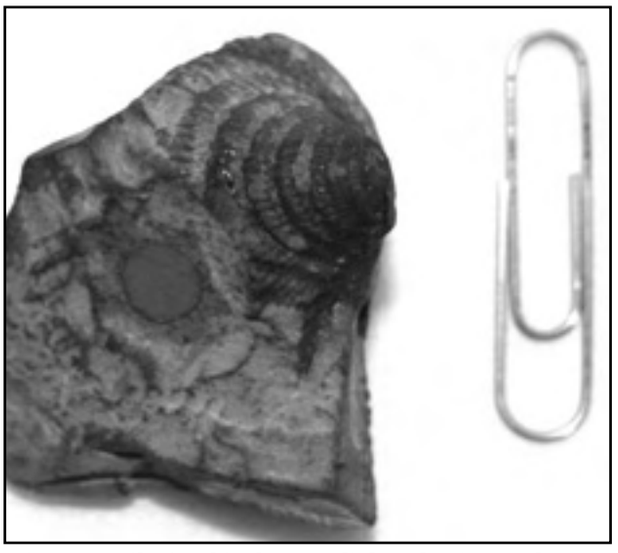

Figure 7. Silurian bivalve* Cardiola salteri *Haughton NMING:F8461.

heavy to be man-hauled to the coast. As McClintock described the event 'To part from my specimens was a trial; I could carry away but a few of the smallest of the geological ones; even my fossil bone I was obliged to leave behind. From unavoidable circumstances, this spot was never subsequently visited.'

The site may never have been revisited in McClintock's lifetime but in 1960 Dr Thorsteinsson and Dr Tozer of the Geological Survey of Canada located the hoard. It took some time to trace Haughton's type material to Dublin but in May 1961 a letter arrived in the National Museum of Ireland from the Director of the Geological Survey of Canada J.M. Harrison requesting a loan of the McClintock fossils. Canadian palaeontologists were able to use the well-labelled specimens brought to Dublin by McClintock to put the cached collection in context and this produced a number of significant papers with redescriptions of Haughton's type material (Bolton 1965, Frebold 1960, Gobbett 1961).

McClintock collected fossil plants at a classic Tertiary locality on the west coast of Greenland near the Danish whaling station at Disko Island. These plant fossils were outside Haughton's experience and were described instead by the leading palaeobotanist Oswald Heer of Zurich. Heer's monograph of Arctic fossil plants ran to several volumes spanning more than a decade (Heer 1868-1878). They included specimens collected by Philip Colomb at Disko and Edwin Moss on Grinnell Land, other Irishmen on Royal Navy expeditions. These are now also in the National Museum of Ireland along with other scientific specimens brought back by McClintock's party (Carte 1857, O'Meara 1860, Walker 1860).

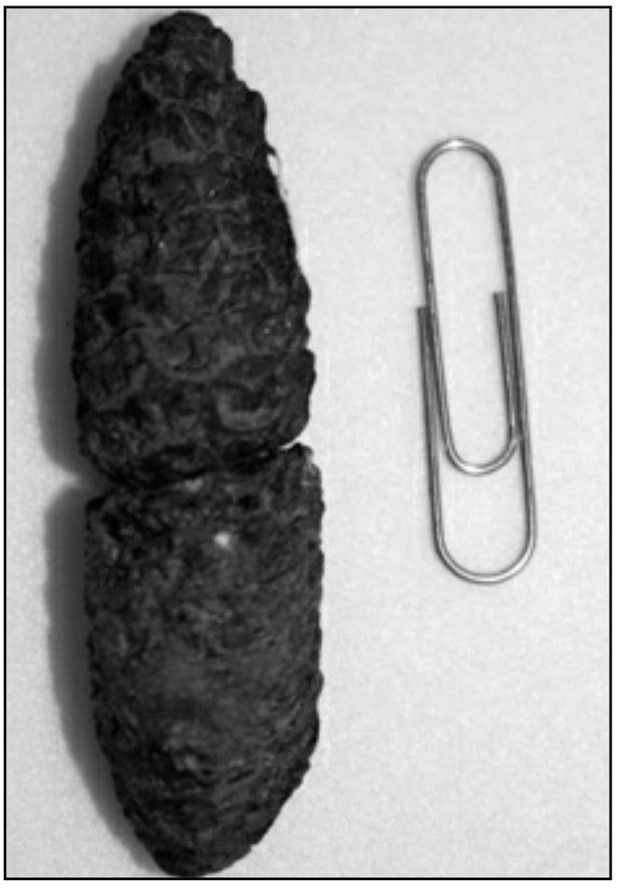

Figure 8. Cone of Miocene plant* Platanus aceroides *Goeppert NMING:F8741.

McClintock's ultimate claim to fame was as the man who led the team that discovered the fate of Franklin's expedition. By 1856 the Royal Navy had largely given up the search after an extensive outlay on what was by then obviously just an attempt to find a now-dead force. It has been estimated that they spent close to £700,000 (approximately £28,000,000 today) on their efforts. A Hudson Bay Company expedition under John Rae had discovered goods from Franklin's expedition after encountering Inuit hunters about 150 kilometres away from what is now known to have been the final resting place of many from Franklin's expedition (Beattie and Geiger 2004). A separate Hudson Bay Company group found other relics. Lady Franklin mounted a campaign for further expeditions, supported by Roderick Murchison, then President of the Royal Geographical Society, but faced with a reluctant Admiralty funded her own vessel the *Fox* under McClintock (Lenz 2003) at a cost of over £10,000 which was only part of an estimated total of £35,000 spent in her personal project to discover her husband, or at least to rescue his reputation. This would equate to £1,400,000 in today's terms (Smith 2006).

Figure 9. Polar bear shot by McClintock. **Ursus maritimus *NMINH:2007.47.35.***

What McClintock discovered in his sledging expeditions from the *Fox* was a trail of relics from Franklin's expedition and a cairn erected in 1848 some ten years earlier. This included a message describing how Franklin's ships *Erebus* and *Terror* had been trapped in sea ice throughout two successive winters without a summer thaw. It recorded how Franklin had died in June 1847 and how in April 1848 another famous Irishman Captain Francis Crozier (Smith 2006) had attempted to lead the men to safety by walking south. The Crozier party had loaded a boat onto a sledge and attempted to drag it across the pack ice towards the Great Fish River where they could have navigated to a trading post.

The boat was discovered by McClintock together with the remains of some crew on the west coast of King William Island. McClintock's discovery was described in his book of the voyage (McClintock 1859) which outsold works by Dickens in Victorian England. It had a significant impact on Arctic exploration and the public imagination. Edwin Landseer, famous today for his painting *The Monarch of the Glen* and lion sculptures at the base of Nelson's column in Trafalgar Square in London, celebrated McClintock's grisly discovery in a painting *Man Proposes, God Disposes*. This oil painting depicts two polar bears finishing off the remains of a once proud expeditionary force at the edge of the empire (Moore 2009).

McClintock had his own encounters with polar bears. In his case McClintock came out the better on each occasion. He was associated with the shooting of at least six polar bears. The first was on 3 June 1849 at Hummock Point, North Somerset Island (McClintock 1857) but it escaped and apparently survived. The second is that described in detail by McClintock, killed in late April 1851 on pack ice between Bathurst Island and Byam Martin Island. A third was shot two days later the animal was standing upright and took a shot through the heart. McClintock recovered the blubber for fuel to use in his stove. Four bears were merely recorded as statistics in tables of game shot. He mentions two bears shot during eight months spent in pack ice from 1857 to 1858 and a further two bears shot while based at Port Kennedy with the Fox from 1858 to 1859.

Dr David Walker, a surgeon and naturalist accompanying McClintock on his early voyages, gives a list of natural history specimens recovered including bears (Walker 1860). He mentions a skin from the Bellot Straits, a young bear from Pond's Bay and a skeleton of a bear. There are no further details and it is unclear where these specimens were deposited or whether any were connected with McClintock. When the ships *Resolute* and *Intrepid* were abandoned frozen fast in pack ice McClintock 'abandoned part of his own personal outfit to find room for the skin of a polar bear' (Haughton 1860b).

The Dublin polar bear was celebrated amongst 34 other specimens in a project to research and photograph surviving polar bear taxidermy, some of which was exhibited in a project *nanoq*: *flat out and bluesome* (Snæbjörnsdóttir and Wilson 2006). This provided the impetus to this author to examine the specimen in more detail and discover a total of eleven holes in the hide, each consistent with a bullet entry or exit wound. All were circular, although some had been elongated through distortions in the hide during taxidermy. Some holes around the head are larger than others and could be consistent with exit wounds. The total number of shots could be eight or nine, including one to the left foreleg, agreeing with McClintock's description which is given in full here.

'It was our custom to sleep by day and travel by night, for the sun is constantly above the horizon at this season, and the snow-glare during the day is more than the human eyes can endure. One morning, as we were about to retire to rest, a bear approached our tents; he was, of course saluted with a shower of musket-balls, and followed by all the men as he hob-

bled away, very briskly however, upon three legs. Not wishing to lose such a rich prize, I imprudently ran before, endeavouring to turn him; when, seeing all his other tormentors far in the rear he *did turn*, but only to make a most determined rush at me; the broken leg seemed no longer an impediment; he had only twenty yards to go, and nearly did it in a couple of springs; in turning to run, the rough ice tripped me, but providentially the bear fell exhausted at the same moment, almost within his own length of me; before the men could come up, he was up again, endeavouring, as before, to effect his escape, but time to reload had been gained, and I soon terminated his sufferings. He was a huge old beast and extremely thin.

I give an extract from my diary here, which explains the singular mode of his approach:-

"Shortly after pitching our tents, a bear was seen approaching. The guns were prepared, men called in, and perfect silence maintained in our little camp. The animal approached from the leeward, taking advantage of every hummock to cover his advance until within seventy yards; then, putting himself in a sitting posture, he pushed forward with his hind-legs, steadying his body with his fore-legs outstretched. In this manner he advanced for about ten yards farther, stopped a minute or two intently eyeing our encampment, and snuffing the air in evident doubt; then he commenced a retrograde movement by pushing himself backwards with his fore-legs as he had previously advanced with the hinder ones. As soon as he presented his shoulder, Mr. Bradford and I fired, breaking a leg and otherwise wounding him severely; but it was not until he had got 300 yards off, and had received six bullets, that we succeeded in killing him. All the fat and blubber amounted to about 50lbs. This, together with some bear-steaks, we took. His stomach contained portions of seal." '

There is only one polar bear recorded in the register volumes of the Museum of the Royal Dublin Society and that is attributed to Erasmus Ommanney, Captain of the HMS *Assistance*, under whom McClintock served as his First Lieutenant. The entry appears under the date 6 December 1851 as 'Captain Erasmus Ommaney [*sic*] 40 Charing Cross, London. A white bear Ursus maritimus. Arctic regions.' According to convention, all property acquired by men under his command while on duty belonged to the Ship's Captain. Ommaney, as McClintock's superior is recorded with the credit for this particular gift.

Honours heaped upon McClintock on his return from the expedition on the *Fox*. His knighthood was presented in 1860 along with promotion to the rank of Admiral and a reward from Parliament of £1,500 (about £65,000 today). His crew were awarded £5,000 by the Admiralty and McClintock received an Arctic Medal. His scientific colleagues in Dublin celebrated his achievements with an honorary doctorate (Haughton 1860b, Wright 1860). While he is remembered almost exclusively for his courageous and efficient expeditions and the discovery of the fate of Franklin and his crew, McClintock deserves also to be noted for a significant early contribution to Arctic geology and zoology as evidenced in his surviving collections.

Acknowledgements

McClintock was the focus of a winter school meeting and exhibition in the County Museum, Dundalk, Co. Louth in January 2008 where family, historians, explorers and devotees met to review his life and times. The author is indebted to participants at that meeting for broadening his understanding of McClintock and his place in Arctic exploration.

Note

Please note that the name McClintock may also be spelled with an inverted comma in place of the lower case c - as M'Clintock. Irish names of this form moved to the lower case c being used in the mid-nineteenth century as a printing convention (Rushton 1979) and this has advantages today in that software handles a letter c better than the inverted comma.

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MEETING REVIEW

ROCK BAND

by Philip Hadland and Sharon Bristow

Science Links in Museums Education (SLIME) is a network of museums and related organisations in the South East of England who support and promote the study of science through a range of museum collections. The SLIME Network has organised training and developed resources. One group of SLIME members have formed a Rock Band, no guitars needed though because their aim is to develop and promote the use of geology collections.

On 14th October 2009 we met at the Natural History Museum in London to discuss ideas for activities using geology collections to inspire audiences. The meeting was suitably held in the *Earth Lab*, a geology focussed education space. The day began with short presentations from members who described the geology activities that they ran in their museums. The audience were then given the opportunity to ask questions and make suggestions for further development.

The first speaker, Denise Balmer from Surrey SATRO [1] talked about ideas to make geology fun. For instance to aid fossil identification she uses two sided illustrations with pictures of fossils on one side and cartoons on the other to make the fossils memorable. An example was an image of a trilobite with a cartoon of a trilobite biting into something on the reverse. In addition, real fossils were also available to handle to create a tactile experience. Simple names were used to describe their taxonomy to younger children, whereas proper names were used with older children, e.g. head vs. cephalon for a trilobite. Another idea was the use of fossils to tell stories of how environments change through geological time and that visual analogies such as a ladder with pictures of fossils at their relevant point are a fun way to illustrate the immense timescales involved.

Gemma Waters and Joan Wiltshire from Hampshire County Museums Service work at SEARCH [2] in Gosport, a hands-on centre for History and Natural Sciences where they run a two hour session for schools curriculum Key Stage 2 called 'Geology in Action: Rocks and Soils'. During this the children find out how to tell rocks, minerals and fossils apart, how they are formed, what they are used for and how they shape the world around us. Activities included 'The Thing Bin', where wrapped specimens were taken by the children from a big plastic bin, unwrapped, discussed and then sorted into rock, mineral, man-made or part of a plant or animal. For rocks and minerals, Lego models were also used to highlight the differences between their structures, with minerals represented by uniform coloured blocks and rocks by multicoloured blocks. Other activities included 'Geology in Your Shopping Basket' which looks at the importance of geology in everyday life and where things come from, and the use of keys to identify different rocks and minerals. They also have a geology trail called 'Rock Around Gosport'. This included a guide to the geology to be found on a walk through the town centre with pictures of buildings of interest and corresponding specimens in their handling collection.

Caroline Frith from Buckinghamshire County Museum [3] presented a similar geology session and trail called 'Rock Around Aylesbury'. This includes a whole day workshop incorporating a hands-on session and a geology trail around the town. In the hands-on sessions the children become keepers and make object record cards, which they can take home giving them some knowledge of how we document geology collections. The trail was simply illustrated in a black and white A4 format that demonstrated an easily updatable and economic approach to producing such a trail.

Sarah Lloyd from the Oxford University Museum of Natural History [4] described their "Dinosaurs - how Science Works" activities for Key stage 3 which are

[1] http://www.surreysatro.org/

[2] http://www3.hants.gov.uk/museum/museum-search/search-for-science.htm

[3] http://www.buckscc.gov.uk/bcc/museum/county_museum.page

[4] http://www.oum.ox.ac.uk/

centred around scientific evidence. For instance in 'Bag of Bones' students are given a bag containing laminated "bones" from which they assemble their best guess of the skeleton and are provided with an opportunity to learn about the nature of fossil evidence. Their 'Dinosaur Dance Floor' activity looks at what information can be gathered through the study of trace fossils and how this can complement other scientific evidence. The activities also include the making of trace fossil casts to take home and finding out why casts of fossils are made.

Dave Smith, the Natural History Museum's Petrology Collections Manager answered questions about the care of geological collections. One question in particular regarded the storage of radioactive rocks. Dave pointed out that concentration of such specimens could be an issue so some very radioactive rocks should be stored in separate areas. He then took us behind the scenes to see the Petrology Stores where the group was shown an enormous garnet taken from a kimberlite mine and thought to be the largest in the world. Another highlight was a large collection of cubes cut from building stones used in buildings across the UK. This collection is used by geologists, designers, architects and archaeologists for identifying and locating the source of unusual stone. There is also renewed interest in sourcing stones for the restoration of the older buildings and monuments in our major cities, which have suffered from air pollution [5].

After lunch, Hazel Gibson and Grace Kimble, science educators at the Natural History Museum, spoke about their activities for school and family audiences. The use of keys to identify rocks, minerals and fossils was a common theme. An example called 'Date with an Ammonite' used a key to identify different species. Another key based activity involved a tray of rocks and looking at what rocks are made of (for young children they related this to cake!).

Finally, Dan Richards spoke to the group about the National Science and Engineering Week [6]. The theme for 2010 is 'Earth' so geology will undoubtedly be a recurring theme and some of the ideas shared by Rock Band may well inspire activites for the week. The British Science Association provides free promotion for events and also funding ideas. It is also a fantastic opportunity to get involved with other organisiations.

The end of the day left time for informal discussion and a walk round some of the galleries in the museum, including the new Darwin Centre. Overall the day proved to be very informative and will undoubtedly inspire new geology based activites. Ideas continue to be discussed via the SLIME Network on Yahoo Groups. We look forward to the next meeting of Rock Band.

With thanks to all the contributors and the Natural History Museum.

For more information about the SLIME Network and Rock Band please contact sharon.bristow@hants.gov.uk, 07843367142

[5] http://www.nhm.ac.uk/research-curation/collections/departmental-collections/mineralogy-collections/rock-collections/building-decorative-stone.html

[6] http://www.britishscienceassociation.org/web/nsew/

GEOLOGICAL CURATORS' GROUP

35th Annual General Meeting

Woodend Creative Workspace, Scarborough.
1st December 2008.

1. Apologies for absence.
Hannah Chalk, Jan Freedman, Mike Howe, Steve McLean, Camilla Nichol, Tom Sharpe.

2. Acceptance of the minutes of the 34th AGM held at National Museum of Ireland, Dublin.
Agreed. No amendments.

3. Matters arising.

5. Secretary's Report.
Scottish Fossil Code: Now available from Scottish Natural Heritage.

4. Chairman's Report.
Although 2008 has been a rather eventful and busy year, I found it difficult to remember what I had actually been doing for the GCG. All I can hope is that I've been doing enough! Some of the more relevant work is summarised below:

1. Correspondence:
JISCmail.
We circulated a note to GEM, ESEU, ESTA and SESEF to make them aware of our JISCmail site and how it could be useful to their members. Hopefully this has been taken up - we did get some positive responses from the groups with an expression of interest in any further developments on our website. If anyone wishes to develop the education side of the GCG website, then please contact HF.

Wren's nest.
A letter of support for a Heritage Lottery Fund application to enhance the National Nature Reserve at Wren's Nest was requested and sent on 25th March 2008. The bid was successful.

Jurassic Coast World Heritage Site.
A response to a request for opinions re: Jurassic Coast World Heritage Site research strategy was sent to Malcolm Hart at Plymouth University on 19th March 2008.

Howard Brunton.
A condolence card was sent on behalf of the GCG. I have, in return, received a card of thanks from Eileen Brunton.

2. Collections at risk:
Bristol City Museum & Art Gallery.
The Assistant Curator of Geology left BCMAG taking up a post at the NHM. The post had been acting up to Curator for the past 2 years. This will leave BCMAG without a geological curator for the first time in 180 years. The geology collections are also Designated.

GCG wrote a letter requesting information and assurances relating to the advertisement of the vacancies. The post will be held vacant until a museum structure review is undertaken in April 2009, though the current intention is to create a joint curatorial/conservation post for natural science with the possibility of an assistant post.

Paul Brown (NatSCA Chair) also wrote a letter expressing concern relating to the future of the biology department as cuts have been proposed. Since then, a Bristol newspaper has reported on some of the concerns and I have received a letter of concern from Unison & Unite in Bristol.

Other collections - watching brief.
Over the year concern has been expressed over the future of Kendal Museum (hopefully proposed plans for its future partnership with further education college will safeguard collections) and North Lincolnshire Museums where the restructure has left no natural history curator in post (we have been assured that the collections are "safe"). As with any such issues, we will endeavour to watch, listen and apply what pressure we can to ensure the support of the geological curatorial community.

3. Natural Sciences Subject Specialist Network.
Latest terms of reference relating to the SSN have been circulated and are now on the GCG website. There is a proposal to use the Collections Link website as a way to bring the work of GCG & NatSCA together under the umbrella of the Natural Sciences SSN. Further work needs to be done to establish how the SSN will operate. My hope is that it will be effectively independent of NatSCA & GCG, but with a number of steering group members that are active participants of both groups to ensure that each groups interests are well represented.

Quite how the SSN will develop is unclear. For those

who have never heard of the SSN programme, please visit www.collectionslink.org.uk/find_a_network /subject_specialists.
SSN's now cover the UK and not just England.

4. NatSCA/GCG representative on committee.
I would like to welcome Leslie Noè (Thinktank, Birmingham) who has agreed to be GCG/NatSCA representative on both committees and thank Steve Thompson who stood down at the last AGM. This is an extremely valuable role that encourages the two groups to work together. There are too few natural science curators & conservators to miss the opportunity to work closely together for mutual support.

5. ICON representative on committee.
A "visitor" to the GCG committee has been proposed: Adrian Doyle (or another ICON member in his absence) has been invited to attend a GCG committee meeting as a representative of Institute of Conservation. We will explore how to work more closely in the future.

6. Web developments.
We have created an online resource for images, which can be used and shared (with minimal restrictions … i.e. credits).

This, we hope, will act as a shared resource, especially as some of the smaller museums are struggling to meet reproduction fees for the larger museum services. If you are interested in sharing any geological images, please visit the GCG web pages and view the Flickr site link. I hope that this resource will grow.

I would also like to take this opportunity to thank Hannah Chalk for all her work on developing the website in the past year. We are always looking for more content and would particularly like to develop geology education resources (to download), handy techniques and hints for working or storing collections etc. The website is a way to get more people involved in the workings of the group. Let us know if you use it, how you could use it and what you can add.

7. GCG logo.
After some debate surrounding the group's logo, it was finally decided to re-scan an original green drawing to a higher resolution & stick with what we already have (including missing apostrophe). For those with an interest I have been informed that originally the apostrophe was left out of the logo due to layout aesthetics!

8. Committee
Finally, thank you to everyone on the GCG committee for their work in 2008 and for helping me to get to grips with the role of Chairman / woman / person / piece of furniture.

Questions from the floor.
N Monaghan. Could the Flickr page be used for identifications instead of emailing the same image to all members?
HF. A good idea. Separate categories could be set up for different types of enquiry.

Report accepted.

5. Secretary's Report.
Three Committee meetings were held during the year. January 24th at the Geological Society of London, 7th May in Manchester and 16th September in Cardiff ahead of the Microclimates Workshop. I would like to thank all our respective hosts for their support. Routine correspondence during the year included Geological Society Science Committee work and minor enquiries, but most other issues have been addressed by Helen, or feature in other reports. One item not reported elsewhere is that of the Guideline for the Curation of Geological Materials. Given the workloads of those involved little progress was being made, and a new strategy has been agreed by the Committee and the Editorial team. The original guidelines have been scanned and made available for download on the GCG website www.geocurator.org. Thanks go to the Geological Society Publishing House for their agreement to this and the provision of a clean copy. Thanks go to Hannah Chalk for her rapid processing and upload to the website. A considerable number of contributions for the revised edition are already received and these will appear as downloadable units or chapters on the website. You should expect to see some appearing in the near future, and thereafter they can be added to as topics are completed. Once the full compliment of topics is achieved, then various options for producing a printed volume will be examined. The Committee believe that this will encourage greater involvement of GCG members in the writing and development of the Guidelines as an evolving tool for curators.

Report accepted.

6. Treasurer's Report.
We end the year in a healthy position with a balance in hand of £10, 9224.66 compared to £8, 628.25 at the start of the year (Balance sheet circulated at the

Geological Curators' Group
35th Annual General Meeting, Scarborough 01/12/2008
2008 Accounts 24/11/07 - 12/11/08

Income				**Expenditure**			
Subscriptions	£	4,339.00	(4705.74)	Geol Curator	£	955.73	(2212.80)
Seminar and workshop fees	£	185.00	(1270.00)	Coprolite	£	1,584.00	(1528.44)
Gift Aid	£	750.25	(1381.88)	Subs rebate	£	51.00	
Coprolite advertisement	£	200.00		Committee expenses	£	357.79	(618.72)
				Brighton medal	£	167.30	
				Web site fees	£	62.02	(96.01)
	£	5,474.25			£	3,177.84	
Balance as at 23/11/2007	£	8,628.25		Balance as at 12/11/2008	£	10,924.66	
		£14,102.50			£	14,102.50	

NOTES

American Account currently at $ 1895.42
European Account currently at 487.22

Auditors: David Green

J R Nudds Treasurer 12/11/2008

Caroline Buttler

meeting). Subscriptions are down slightly, but this is not a cause for alarm, since last years figure was inflated by the large number of back subscriptions extricated from members by your Membership Secretary. Seminar and Workshop income is also substantially down on last year, but this is due to meeting organisers tending to look after their own income and expenditure, simply presenting any profits made (thus there are also no Seminar and Workshop expenses this year). Gift aid is also lower than last year, but again last years figure included back payments for 3 previous years, whereas this years figure is for a single year. Hence the Gift Aid per annum has actually risen substantially, due to the increase in subscriptions paid. An additional £200 income from advertisements in Coprolite is due to efforts by Mike Howe to whom I am grateful.

Expenditure is dominated by the printing and distribution of *Geological Curator* and *Coprolite*. Expenditure for the former is only half that of last year due to the fact that only one issue was produced this year instead of the normal two. The second issue is due imminently and had this been included in this years accounts, our year end profit of more than £2000 would have been approximately halved. Expenditure for three issues of Coprolite is similar to last year. Committee expenses have been reduced by the prudence of Committee members to whom I am grateful.

The American dollar account stands at $1895.42 ($1687.42 last year), and the European account stands at 487.22 (163.37 last year). I would like to record my thanks to Tiffany Adrain and Matthew Parkes for their stewardship of these accounts, and to Caroline Buttler (Cardiff) and David Green (Manchester) for their willing auditing of the accounts. Finally, I thank Cindy Howells for her continued support as Membership Secretary.

Membership Report.

Membership levels (2007 in brackets) are:

Personal UK	169	(172)
Personal Overseas	18	(18)
UK Institutions	63	(62)
Overseas Institutions	26	(27)
Honorary	9	(8)
Total	285	(287)

Membership fees for 2009 are now due and we will be happy to accept payments at this meeting.

Report accepted.

7. Programme Secretary's report.

Two Workshops and one seminar have been held.
April 2008. GCG Workshop: Geology and Archives. Manchester Museum.
May 2008. Joint GCG and Geoscience Information Group Seminar: Exploiting Geoscience Collections. Geological Society, Burlington House, London.
September 2008. GCG Workshop: Microclimates for your collections. National Museum of Wales.

2009 programme.
12-13 May. GCG Workshop: Casting geological specimens. British Geological Survey, Keyworth, Nottingham.
22 September. GCG Seminar (joint with Society for Vertebrate Palaeontology). Bristol University.
December, GCG AGM and Seminar: Storage, sorting and documentation - good practice and practical solutions. Leeds City Museum and Art Gallery.

Committee is still looking at foreign study tours, but the membership need to let Committee know what they want and where they want to go.

Questions from the floor.
B. Loudon. Could we have more variety in the venues? Many meetings seem to be held in regular places.
HF. The recent survey (in Coprolite) suggested that members wanted more locations in the North of England and Scotland. The issue is being looked at and we encourage people to offer their venues for meetings and workshops - preferably at little or no cost to the membership.

Report accepted.

8. Journal Editor's report.

I offer my sincere apologies to the members for the lateness of the Journal in 2008. It is entirely due to my own circumstances and over commitment to too many tasks and roles. Volume 8 No.9 will appear very shortly after this meeting as it has largely been laid out and proofed. Volume 8 No.10 will appear soon afterwards as the content had been received and needs laying out and proofing. The creation of an index to the volume will take some time, but a January distribution is planned, as it should be completed during Christmas. If anyone would like to assist in the production of the Index then please contact Matthew Parkes.

Despite problems with editorial time, the good news is that the level of papers submitted is healthy with content for Volume 9 No. 1 already received or reli-

ably promised in time for a spring 2009 publication. A thematic issue is planned for Volume 9 No.2 in late autumn 2009. Contributors to the joint SPPC/SVPCA/SVP preparator's session in Bristol in September will be encouraged to submit for that issue.

Despite this healthy rate of papers being submitted and in prospect, there is room for more and all members are encouraged to submit papers wherever possible. In addition to full papers, I am keen to encourage more short notes, fact files, Lost and Found items, label information and book reviews.

I would like to thank David Craven for organising and supplying book reviews in 2008 and encourage members to contact him with reviews or suggestions of new titles to organise for review.

Report accepted.

9. Newsletter Editor's report.
2008 saw completion of the 19th year of publishing Coprolite. As usual, three issues (Numbers 55, 56, And 57) were published, in March, June and November, totalling 48 pages (compared with 42 last year and 38 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 moves, or anything at all related 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.

Report accepted.

10. Recorder's Report.
The handover from Helen Fothergill to Mike Howe took place during the summer and the new Recorder is currently reviewing strategy, considering new, and existing initiatives.

Report accepted.

11. Election of Officers and Committee for 2009.
No nominations have been received from the general membership, so Committee recommends the following changes:
Secretary. David Gelsthorpe to replace Matthew Parkes.
Committee. David Craven and Lyall Anderson.
Co-opted members. Will Watts, Cindy Howells and Hannah Chalk are happy to continue.
Proposed: Leslie Noè.
Seconded: Nigel Monaghan.
Changes agreed.

12. Any other business.
None.

13. Date and venue of next Annual General Meeting.
Leeds City Museum and Art Gallery. Date and venue to be confirmed.

In closing the meeting, Helen Fothergill thanked Will Watts and the staff at Woodend Creative Workspace and the Rotunda Museum for their time and hospitality.

THE GEOLOGICAL CURATOR

Publication scheme

Two issues of The Geological Curator are published for each year (usually in the Spring and the Autumn); a complete volume consists of ten issues (covering five years) and an index.

Notes to authors

Articles should be submitted as hard copy in the journal style, on good quality paper (A4 size) double spaced, with wide margins, and on disk (although e-mail submissions are also accepted). Three copies should be sent to the Editor, Matthew A. Parkes, Natural History Museum, Merrion St., Dublin 2, Ireland (tel 353-87-122-1967; e-mail: mparkes@museum.ie). Line drawings should be prepared in black ink at the desired publication size. Photographs for halftone reproduction should be printed on glossy paper. Both drawings and photographs should be proportioned to utilise either the full width of one column (85mm) or two (175mm). References in the text follow the Harvard system, i.e. name and date '(Jones 1980)' or 'Jones (1980)'. All references are listed alphabetically at the end of the article and journal titles should be cited in full. Authors will normally receive proofs of text for correction. Major articles are refereed. Copyright is retained by authors.

If submitting articles electronically please note the following:

1. Do not 'upper case' headings. Keep all headings in upper and lower case.
2. Use italics rather than underline for latin names and expressions, journal names and book titles. Use bold for volume numbers in references.
3. Line spacing. Your hard copy should be double spaced. If possible, single space your copy on disk. Use a single (hard) carriage return at the end of each paragraph.
4. Single space-bar between words, double space-bar between sentences.
5. Do not attempt to format your article into columns. Use a minimum of tabs and indents.

Regular features

LOST AND FOUND enables requests for information concerning collections and collectors to reach a wide audience. It also contains any responses to such requests from the readership, and thereby provides an invaluable medium for information exchanges. All items relating to this column should be sent to the Editor (address above).

FACT FILE contains basic information for the use of curators. All items relating to this column should be sent to the Editor (address above)

NOTES comprising short pieces of less than two pages are particularly welcome. Please send contributions to the Editor (address above).

GALLERY REVIEW comprising short pieces on new museums or exhibitions.

CONSERVATION FORUM helps keep you up to date with developments in specimen conservation. Information on techniques, publications, courses, conferences etc. to Dr Caroline Buttler, National Museums and Galleries of Wales, Cathays Park, Cardiff CF10 3NP, Wales, UK.

BOOK REVIEWS contains informed opinion about recently published books of particular relevance to geology in museums. The Editor welcomes suggestions of suitable titles for review, and unsolicited reviews (of 500 words maximum) can be accepted at his discretion. Publishers should submit books for review to David Craven (see inside front cover for address).

INFORMATION SERIES ON GEOLOGICAL COLLECTION LABELS consists of loose A4 size sheets, issued irregularly, which carry reproductions of specimen labels usually written by a collector of historic importance. The aim of the series is to aid recognition of specimens originating from historically important collections. Contact the Editor.

Advertisement charges

Full A4 page	£80 per issue
Half A4 page	£60 per issue
Quarter A4 page	£40 per issue

25% discount for space bought in three or more issues. Further details from the Editor.

Inserts such as publishers' 'flyers' can be mailed with issues of The Geological Curator for a fee of £80 per issue. 350 copies of any insert should be sent to the Editor.

Subscription charges 2009

UK Personal Membership	£15 per year
Overseas Personal Membership	£18/ US$32/ EURO 25 per year
UK Institutional Membership	£20 per year
Overseas Institutional Membership	£22/ US$40/ EURO 32 per year

All enquiries to the Treasurer, John Nudds, Department of Earth Sciences, University of Manchester, Oxford Road, Manchester M13 9PL, U.K. (tel: +44 161 275 7861; e-mail: john.nudds@manchester.ac.uk).

Backnumbers

Backnumbers of The Geological Curator (and its predecessor, the Newsletter of the Geological Curators' Group) are available - please enquire with your requirements. All issues are available for download from www.geocurator.org.