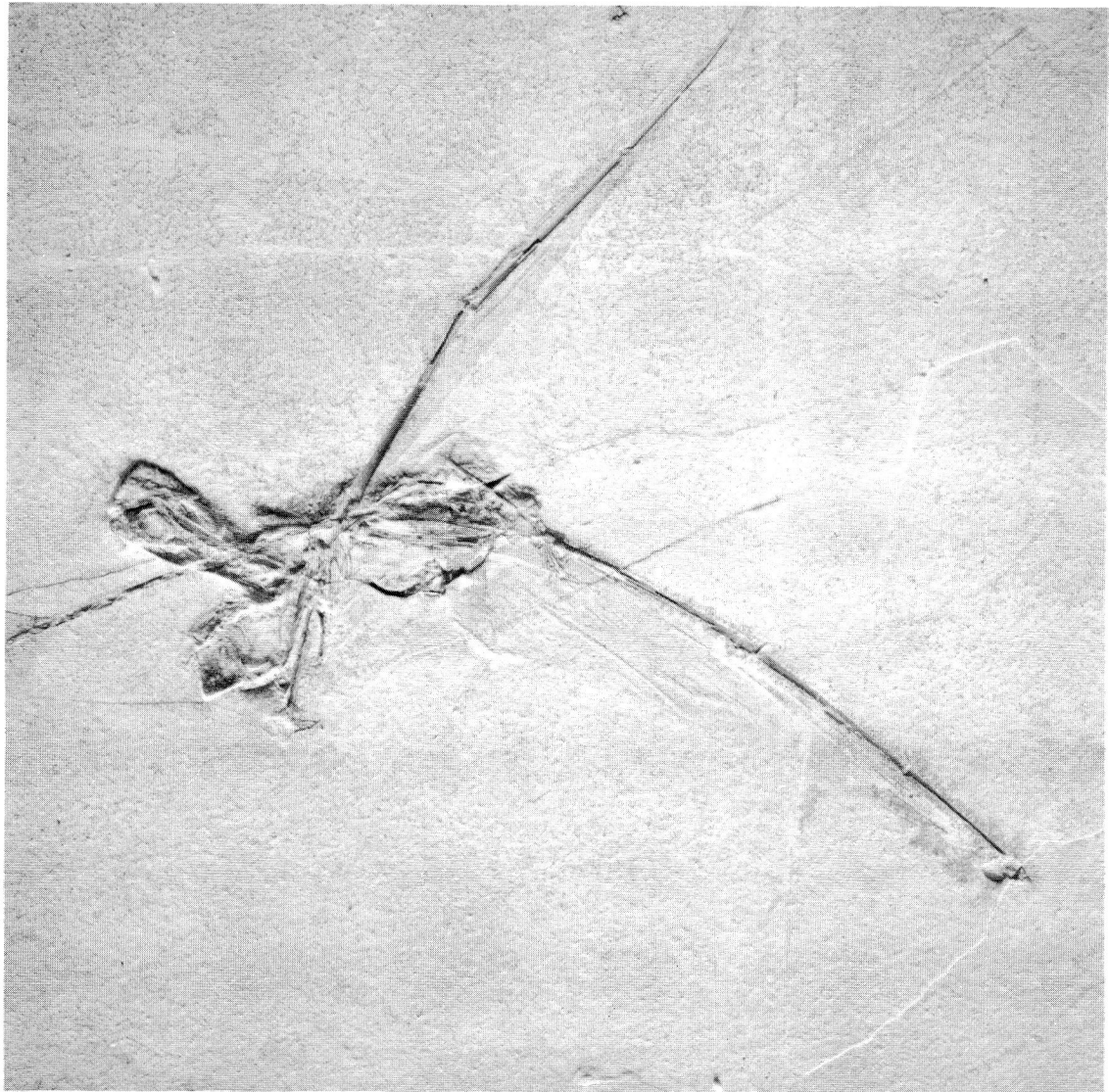


GEOLOGICAL CURATOR



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GEOLOGICAL CURATORS' GROUP

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

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

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Cover: *Rhamphorhynchus gemmingi*, a rare Jurassic pterosaur from the Solnhofen region, Bavaria, Germany, recently purchased for £55,319 by the National Museums of Scotland. This particularly fine specimen had a wingspan of 130 cm in life (photo courtesy M. Taylor).

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LONDON CLAY NAUTILOID COLLECTIONS

by Roger A. Hewitt



Hewitt, R.A. 1995. London Clay Nautiloid Collections. *Geological Curator* 6(3): 117-124.

The history of collecting from the Eocene London Clay Formation of south-east England can be divided into six cycles. Each period of maximum collecting activity results from: 1) fashionability of pre-Pleistocene palaeontology, 2) availability of fossils from construction work, clay-based industries and coastlines, 3) establishment of public museums and higher educational establishments. The critical dates for the start of intensive collecting approximate to 1696, 1747, 1807, 1836, 1923, and 1969. The earlier cycles are obscured by the largely private ownership of fossils before 1837, and gave rise to English systematic palaeontology in 1812. This systematics of James Sowerby was initially no more advanced than the informal classification gradually developed from older collections, but it culminated in improved taxonomic discrimination. The last three cycles represent the largely informal First, Second and Third London Clay Clubs.

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Introduction

Nautiloids are among the largest and most attractive fossils available from the Eocene London Clay Formation of south-east England. The gradual accumulation of these scarce fossils in museums illustrates variations in public awareness of fossils during the whole history of modern England and research on living *Nautilus* (Davis 1987, Jacobs 1992). The author having previously requested news of the occurrence of London Clay nautiloids in museum collections (Hewitt 1991) now considers the historical significance of the resulting census of museum (Table 1) and privately owned specimens.

The growth of the 210 known private collections used in this census of 1277 surviving or figured specimens is illustrated by a cumulative count of the number of specimens collected before a certain date (see Figure 1). In most cases the approximate date of collection was deduced by investigation of the dates of construction of railways at particular labelled London Clay localities. Other dates were obtained from direct enquiries and museum acquisition registers relating to small donations. In the last resort the specimens were given an approximate collection date and then assigned to decades in proportion to the frequency of the better dated specimens. The resulting curve (Figure 1) illustrates the First (1836-47), Second (1923-40) and Third (1969 to date) London Clay Clubs defined by Elliott (1970). The bifurcation of the line since 1970 gives a minimum estimate of the size of privately owned collections in

1992. The lost Lethieullier (Delair 1979), Jones (1781) and Hunter collections (Morris and Owen 1856) are added to provide a minimum estimate of mid-eighteenth century collecting activity. An earlier period of collecting is discussed by Price (1989) and Hewitt (1992). The surviving collections from Richmond were probably made when the spa there was redeveloped as "the Wells" in 1696.

Individual collections

The surviving museum specimens (Table 1) include a relatively small number of individual collections of any size: N.T. Wetherell (1800-1875) of Highgate (114 plus perhaps 8 Irish specimens), F.E. Edwards (1799-1875) of London (63), C.J.A. Meyer (1832-1900) of London (36), A.G. Davis (1892-1957) of London (23), S. Lethieullier (1701-1760) of Ilford (24 from various Sheppey collectors, lost), F. Dixon (1799-1849) of Worthing (20), A.G. Wrigley (1885-1953) of London (17), A.W. Boatman of Grays (15 from Southend 1853), J. Woodward (1665-1728) of London (13), J. de C. Sowerby (1781-1871) of London (11, excludes his father's material), S.H. Warren (1872-1958) of Loughton (9) and F. Gordon (9 from Hampstead 1884-1895).

Three Sheppey specimens were catalogued by E. Borson (1758-1832) at Turin University and an old Highgate specimen is housed in the Natural History Museum in Paris. Probable late 19th Century *Simplicioceras* finds are housed in Stockholm (1), Harvard (>2) and Tubingen

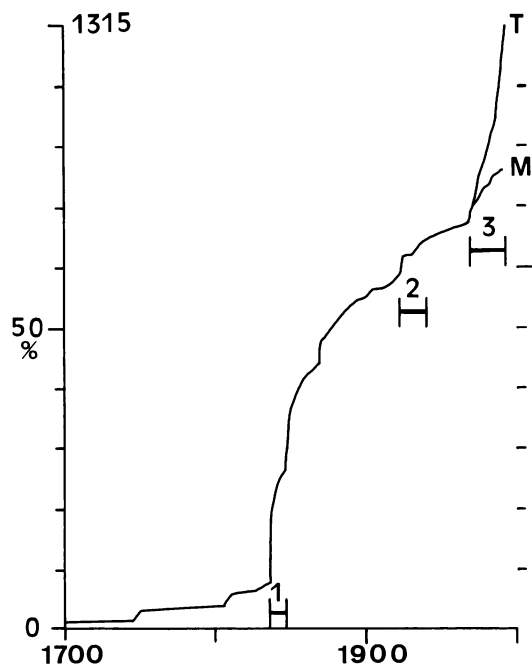


Figure 1. Graph showing cumulative percentages of 1315 Eocene nautiloids collected between 1695 and 1994. T=total. M=Museum and University.

(3). Another was collected by the young Prince Waldemar of Prussia in 1869, and was made available from the Royal Collection, Osborne House.

The following privately owned specimens were kindly made available by T. Foskett (1), D.M. White (1), M. Woolven (1), M.P.R. Harris (1), Dr P.S. Balson (1), N.C. Lovett (1), G. Woollard (1), C. Walpole (1), G.A.J. Cumberland (2), S. Tracy (2), Dr H.P. Wilkinson (2), J. Saward (2), G.R. Ward (3), M.J. Salmon (3), W.H. George (3), A. Oxford (3), R.C. Wrayton (3), D.J. Kemp (3), C. King (4), D. Turner (5), D. Raynor (4), A.J. Rundle (4), R.A. Higgins (4), G. Lucy (5), J.K. Craig (6), A.A. Mitchell (8), J. Bruce (9), E.A. Jarzembowski (10), H. and R. Downer (10), W.J. Quayle (12), G. Woodhall (13), G.C. Stratton (14), M.C.S. Daniels (15), R.C. Fox (17), R.J. Williams (19), D.R. Searle (23), D.A. Bone (24), D. Breden (41) and M.G. Challen (46).

These statistics for private collections explain the widespread but scarce occurrence of these fossils in English museums. The author visited the Sheppey coast section in 1967, 1981 and 1989, without finding any specimens. It proved better to follow the example of Bowerbank (1840), who probably collected three pyritic nautiloids from Sheppey beaches, and to contact local inhabitants familiar with nautiloids. But collectors grow tired of gathering these large and or unstable concretions.

Birth of systematic palaeontology

There is little doubt that the involvement of James Parkinson (Cleevely and Cooper 1987) and others in

the foundation of the Geological Society in 1807 stimulated the growth of their nautiloid collections. A *Euciphoceras* specimen (Hunterian Museum S.275), possibly from Sheppey, illustrates the terminology which first appeared on labels at that time: "*Nautilus* showing siphuncle. Tertiary formation London Clay". Species names were added to later 19th Century labels after the discovery of nautiloids at Highgate Archway and their description by James Sowerby (1755-1822). The variously reported dates of this discovery are between those of local tunnel construction (1808-9) and collapse (April 13-14th 1812) noted by Clunn (1957). Early "Highgate" specimens survived in the Sowerby Collection and were incorporated into the Natural History Museum in 1861, and the "Old Collection" of the British Museum (e.g. *Cimomia* BMNH C.3401 catalogued as "old collection" in 1890 and recognized as the specimen figured on a separately published initial plate of the *Mineral Conchology* by G.F. Potter; see also Phillips 1982). Small Sheppey and Highgate *Cimomia* were illustrated on "Tab. I" of the canonical *Mineral Conchology* published on June 1st 1812.

An earlier peak of collecting activity took place after 1747. It appears to have been stimulated by news of the work of George Buffon. He interpreted orthocones as the remains of living animals which might soon be discovered like the *Nautilus des Indes* described as a cephalopod by Rumpf in 1699 (Davis 1987). One of the Latin editions of Rumpf (1711 or 1739, see Davis) was cited after 1748 in the first set of fossil *Nautilus* descriptions by Smart Lethieullier (c. 1750). His manuscript used the name "*Nautilus*" for the Sheppey species now known as *Cimomia imperialis* (J. Sowerby, 1812), "small *Nautilus*" and later "small *Nautilite*" for *Simplicioceras centrale* (J. Sowerby, 1812), and "*Nautilus of an uncommon species*" for a probable *Deltoidonautilus*. The later catalogue of Borson (1830) was probably based on another large 18th Century collection from Sheppey. *Cimomia imperialis* was identified as "*Nautilus pompilius*" L., *Simplicioceras* as *marmoreus*, and *Aturia ziczac* (J. Sowerby, 1812) as *Orbulites* Lamarck, 1799 (now applied to foraminifera).

The Borson entry for a surviving 110 mm diameter nuculus of a *Cimomia imperialis* is not unlike the Lethieullier descriptions of imploded specimens translated here into the metric system:

Borson (1830: 633) writes "1. "*Nautilus pompilius, fragenta pyritica, superstite testa, pyritis et spato calcareo in concamerationibus cristallinis; ex insula Sheppey.*"

Lethieullier mss. p.16-17 includes "N3 A large Nodule of blue stone almost as hard as marble its surface shining like Mother of Pearl, within it, is lodged a

Nautilus about 100 mm in diameter. There are 23 cells with the siphunculus passing through them plainly visible, some of the cells at the tail are filled up and two or three of the nearest diaphragms broke away. The diaphragms in some places seem pressed together by the outward crush but many of the cells are quite open only their sides (as is likewise the siphunculus) incrustated with a yellow spar. This stone weighs 14 kg was found in the cliffs of the Isle of Sheppey and sent me by Rev. Mr Hayward."

Cimomia No. 13 on p. 19 measures *c.* 180 mm by *c.* 127 mm. "The external coat is covered with Mother of Pearl. Being sawn asunder the first two chambers appear to be filled with hard stone, nine of the succeeding ones are crushed and partly filled with the before mentioned sparry-waxen vein which takes a bright polish. The remainder towards the center are entirely empty and appear to be the shell as it is in a recent state." No. 30 on p. 122 "A large [*Cimomia*] measuring *c.* 230 mm by *c.* 180 mm covered on the outside by a beautiful mother of Pearl. Being divided the outer convolution appears to be formed of hard blue stone and the first visible chambers are blended together by some external compression. The diaphragms are then extremely distinct and covered with a thin coat of the waxen vein. A continued siphunculus formed of the same sparry substance passes through 12 succeeding chambers. It is then discontinued for a small space, the diaphragms being being destroyed but again makes its appearance at the center."

John Hill (1706-1775), who may have been the first person to call the calcitic concretions by the more "expressive" name "Septariae" (Hill 1748: 502), illustrates this emerging systematics in his attempt at writing a popular natural history of fossils. Hill (1748: 649) writes:

"*Nautilus Graecorum*, a shell not found on our own or any neighbouring shores: yet buried in strata of earth in almost all parts of the Kingdom. Our clay-pits about London have furnished me with many specimens of them, particularly that behind St. George's Hospital at Hyde Park Corner, where they are found considerably large. The cliffs and shores of the island of Sheppey abound with them; some loose in the clay some bedded in the Septariae... The several cells or diaphragms and siphunculus, or pipe of communication in most of these is very plain. But beside this kind, we have found some others which have undulated or studded surfaces; and that in the clay-pit behind St George's Hospital that beautiful species called *Nautilus Armatus* or Maïld Sailor is very common."

Jones (1781: 392), who probably visited Sheppey in 1763, explains that the large *N. graecorum* were called "sea eggs". The local copperas gatherers (George

1984b) doubtless concentrated these *Cimomia* for sale to collectors. Jones (1781: 380) implies that the armoured species of Hill and his own "small mailed nautilus from Sheppey copperas" is *Simplicioceras*. But even James Sowerby did not immediately realise that the larger common species from the upper division B2 of the London Clay below Hyde Park was not the same as the large species from Sheppey. In 1822 he described *Euciphoceras regale* noting that "it is remarkable that the prevailing species of *Nautilus* found ... in 1815, and also in Hyde Park, should be different from that found at Highgate, and upon the Isle of Sheepy".

The three London Clay Clubs

This early history is obscured by the failure of most pre-Victorian museums and private collections to survive. The decisive event was the initiation of a separate catalogue of numbered fossils acquired by the British Museum, and took place on March 25th 1837. This was a result of the increased popularity of palaeontology. The first specimen was an ammonite supplied by H.T. de la Beche. Specimen BMNH 103 is a London Clay *Euciphoceras* registered as "part of a large *Nautilus* incrustated with Pyrites. Hampstead. Presented by Dr. Howship". Dr. John Howship M.D. (1780-1841) had done experiments on bone formation published in 1815 and this may account for his interest in the hollow aragonitic chambers with a thick pyrite cement. He appears to have made a single donation and was an influential person who practised at Saville Row. Howship gave the Hunterian Oration in the same year (1833) as the likely collection date from the Hampstead Well at Lower Heath. This site was studied by N.T. Wetherell and yielded a nautiloid (BMNH c.82303) in the collection of F.E. Edwards.

Cycles in collection dates result from changes in the popularity of geology, enhanced by popular publications and innovations of geological theory, as well as subsequently favourable collecting and curatorial conditions. In the case of the "First London Clay Club 1836-47" there was the "best seller" of Charles Lyell and other books published in the previous decade which helped increase the status of geology. It might be thought that news of the discovery of a live *Nautilus*, which reached London in 1831 (Davis 1987), was the first stimulus towards a new biological analysis of the London Clay specimens. Sarah Wallis (1791-1856), who first married the naturalist Thomas E. Bowditch (1790-1824) and then Robert Lee, disproved this notion by writing such a review in 1830. It was based on the old discovery of *Spirula* tissues and an ordinary Sheppey *Cimomia* "now in the possession of the Rev. Francis Cobbold, Cliff, Ipswich" (Lee 1831). James Mitchell

(1785-1844) wrote that “no species excites greater admiration than *Nautilus*” in notes on Sheppey written before 1836 (p. 125 of volume 1 in his mss.). Interest in these particular fossils evidently predated the biological news.

These early Sheppey finds are difficult to date in surviving collections and Figure 1 overemphasises the importance of the two subsequent periods of railway construction “mania” during 1836-7 and 1844-8. Good steamboat connections between London and Sheerness, and the old copperas and new cement industries based on London Clay concretions (George 1984a, 1984b), had permitted a tourist trade in London Clay fossils to develop at Sheppey by that time (Bowerbank 1840). Railway construction provided an opportunity to collect or purchase unweathered pyritic specimens. Geological tourism further increased in popularity after the completion of the railways. Hewitt (1992) and Bone *et al.* (1992) deduced that the similarly cut and polished Bognor nautiloid specimens were prepared and sold by two local lapidarists (Richard Wyse and John Fielder) between about 1830 and 1860. The London Clay Club evolved into the Palaeontographical Society which published descriptions of London Clay nautiloids during July 1849 (Edwards 1849).

The “Second London Clay Club 1923-40” (Elliott 1970) was probably a response to the revolution in the biostratigraphic analysis of older rocks and similar new archaeological methods. Thus Kennard and Warren, who had previously donated nautiloids to the Natural History Museum (Table 1), concentrated their attention on Pleistocene sites, while E.T. Newton of the Geological Survey Museum converted Wrigley to the opposite cause of Eocene biostratigraphy. Wrigley had catalogued some easily faked flint artifacts at Hackney Museum in 1911 and made a London Clay collection from Chingford in 1914 (the nautiloid seems to be lost). A small but dedicated band of collectors, frequently local residents of coastal sites, obtained diverse collections of pyritic seeds, bird bones and microfossils, as well as molluscs (Bone 1992). Their attempt to relate these finds to local and regional stratigraphies proved to be difficult, but this did not detract from the biological value of the collections. Elliott (personal communication 1989) comments that “I spent a lot of time at Sheppey, years ago, and it was always a good day when I found a nice nautilus. I wish I had kept them.”

A “Third London Clay Club” may be currently recognized within the membership of the Essex Rock and Mineral Society founded in 1967, the Tertiary Research Group founded in 1969 (Cooper 1981), the Medway Lapidary and Mineral Society founded at Gillingham in 1975 (H.W. Day personal communication 1992) and other local societies seen at the Annual

Reunion of the Geologists’ Association in London. A typical modern collector was born in the 1950s and started collecting fossils as a teenager, but their dates of birth probably span a range from about 1915 to 1977. G.R. Ward argued that finds from motorway construction sites in Essex should be housed in the Passmore Edwards Museum and organised collectors into a team who sampled the highest levels of the London Clay (see Table 1).

It is not easy for the residents of the London area to know that they are living on one of the world’s most important Tertiary fossil sites, or to recognise most of the fossils in a temporary excavation. Local and national museums situated in the metropolis had a role in displaying these fossils to the public and accepting donations. The author suspects that the displays in the former Geological Survey Museum were influential in the post-war period. His non-geological parents even made it the venue for their 91st date in February 17th 1947. The Natural History Museum was closed at the time due to bomb damage, but it soon performed a similar educational function. The popularity of Tertiary geology was increased by their publication of the handbook *British Cenozoic Fossils* (first edition 1960), containing excellent drawings of wisely selected species originally prepared by A.G. Wrigley. It is less well known that some of the work was done by John Cooper, then a young member of staff.

Rocks other than flint are a novelty in most parts of Essex. The Pleistocene elephant excavations at Aveley attracted sixteen thousand people to this nautiloid locality in 1964-5. The mammoth was found by William Hesketh, a 22 year old chemist who still prefers later Tertiary molluscs to the smooth and broken nautiloids. Some of the audience probably took up London Clay studies at that time. The writer did not visit the site and had left Essex before the first meeting of the Tertiary Research Group took place. He was surprised to find that much of the palaeontological education of one of the curators in charge of the nautiloids had been provided by himself in a forty minute lecture at Westcliff High School on 5th February 1968.

The discovery and display of the 1969 *Euciphoceras* finds from the Victoria Line in Pimlico attracted interest at the Geologists’ Association Reunion. Paleobiology and the “Plate Tectonics Revolution” made fossil collecting increasingly popular (Figure 1). Neither the “persistent *Nautilus* is fairly common” advertisements of Forbes (1956: 82) and Woods (1961: 311), nor an influential BBC radio for schools series (Taylor 1963), could rival the television images resulting from the renaissance of work on tropical *Nautilus* (Bidder 1962, Ward 1988, Helton 1989). A controversy over the use of *Nautilus* in discussions of the increasing distance

between the Moon and the Earth, produced a study of specimens of Miss Cowderoy and E. Forbes in 1979. Hughes (1985) showed that the London Clay genus (*Euciphoceras*) most allied to *Nautilus* had half as many lirae per chamber and rejected this approach. The writer had learned of the renaissance from an English newspaper article by Vernon C. Barber in January 1967. His first museum and *Nautilus*-based study took place in November 1985 at the instigation of Dr H.G. Owen (Hewitt 1989).

Professional micropalaeontology resolved stratigraphic problems associated with the poorly exposed London Clay. King (1984) also described a series of marker horizons within the slumped clays of Sheppey, which finally permitted collectors to record the stratigraphic position of their finds.

Conclusions

The collection history of these nautiloids probably consists of six episodes separated by periods when archaeology and Pleistocene geology had a dominant influence on Londoners. This tended to occur when theoretical geology was either directly concerned with the Pleistocene (e.g. 1820s, 1860-1910, 1950s), or emphasized lithological aspects of strata (e.g. Werner, Hutton, geological surveys).

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Table 1. Number of nautiloid specimens observed in museums and other institutions and their estimated collection dates from the London Clay. The first names and titles of known collectors are given if they cannot be found from Cleevely (1983). The symbol < is used in collections potentially made a decade or more before the cited date. Localities are London Clay sites or museums not residences.

Essex and N.E. London

6 *Chelmsford and Essex Museum*: Mr. F. Goodwin c.1905, - 1981, Mr. Burton c.1985

13 *Colchester and Essex Museum*: Josias Bryant 1846, Rev. William Burgers <1850, Mr. J. Francis 1871, the early 20th C. Sudbury Museum, - 1970, Mrs W. J. King 1977.

1 *Harlow Museum*: recent find donated before 1973.

27 *Passmore Edwards Museum, Stratford*: Essex Field Club Collection represented by single 175 mm diameter *Euciphoceras* labelled "loc. incog."; A. G. Wrigley Rayleigh specimen of 1923 lost by pyrite decay. The following specimens collected in 1973-82 are additional to those listed in the text: Brian E. Brett, Mr. J. Elliott 4, William H. George 3, Christopher King 2, John Needham, C.J. Smith, John O'Sullivan, Graham R. Ward 10, F. E. Willox, Graham Woollard 2. Four others not found.

2 *Queen Elizabeth's Hunting Lodge, Chingford*: 68/47 and 68/48 from ? Essex Field Club.

1 *Saffron Walden Museum*: ?no. "156" from George S. Gibson mid-19th C.

15 *Thurrock Local History Museum, Grays*: Mr. A. W. Boatman ?"London Clay Southend Sept. (18) 53".

1 *Vestry House Museum, Walthamstow*: 1992 enquiry.

Other London Collections

1 *Birkbeck College, then at Gresse Street*: F31 paired with BMNH C.3664, mid.-19th C.

5 *Bruce Castle Museum, Tottenham*: "North London" *Euciphoceras* resembling Hackney Museum late 19th C. specimen; "E.R.J." c.1920 may include *Cimomia* from Highgate, Muswell Hill and Sheppey; Larger one from main (early 20th C.) Highgate sewer via "L.B.H." Engineers Dept. 1976.

1 *Cuming Museum on Walworth Road*: *Euciphoceras* of Mr. E.T.R.W. from Nunhead c.1875. S. Timberlake found a Sheppey specimen of Sir Ashton Lever in catalogue.

>3 *Gunnersbury Park Museum near Brentford*: Two *Simplicioceras* Mr. W.H.H. Brandford from Chiswick (S. Timberlake found another later) 1925, Mr. D. Sharp 1980.

2 *Hackney Museum, Mare Street*: *Cimomia* 446 and *Euciphoceras* 459 are not the Recent *Nautilus* in the catalogue of the J. S. Soul Collection. They may be finds made (c.1889) by Mr. J.E. Greenhill at Mare Street and at Mildmay Road respectively.

- 1 *Highgate Literary and Scientific Institution*: G.F. Potter Highgate *Cimomia* (c. 1830 Wetherell?)
- 7 *Horniman Museum, Dulwich*: Bognor specimen of E. N. Dalton not located, *Euciphoceras* from H. (Horton) Asylum 1914 probably via by Sir James Moodie, Gunnersbury Park Museum *Cimomia*, Arthur H. Verstage Muswell Hill *Cimomia* <1978, R. K. Batch 1972, Mr. Dehor 1974.
- 3 *Imperial College, South Kensington*: (late 19th C.)
- 330 (plus 88 uncatalogued) *Natural History Museum*: Sir H. Sloane and two "old coll." c.1700, Dr. Henry Menish <1808, W. Smith; Dr. Charles "Sutton" of Norwich, "Wallis", "Saul" and other specimens of J. Sowerby c.1810; G. A. Mantell 1820 and with Dr. George Hall, Baxter and Parker c.1839; J. de C. Sowerby 1827-48, "old coll." from Essex coast and near Chalk Farm, Dr. John Howship ? 1833, N.T. Wetherell 1833-50 and 1865, F.E. Edwards 1833-67, J.S. Bowerbank <1836, S.P. Pratt 1836, Sir William Clay 1837, Wimbledon specimen via Vernon Edwards, J.T. Smith, Miss Cowderoy, E.H. Hanley <1842, Mr. Woodward 1844, F. Dixon <1849, Sir J. Prestwich 1846-55, Mr. Ball (?of Grays) 1846, A. Robertson <1853, J. Morris 1848, H. Daniels 1855, E. Spencer 1855, Stratford 1856, W. Griffiths 1855-61, G.F. Potter ? 1856 and 1904, Miss Wilson <1860, Charles Mathews 1861, S.H. Beckles, B.M. Wright 1867, Egerton and Tennant collections, W.H. Shrubsole 1880, R. Maitland 1884, J.F. Blake and F.H. Butler, G. Clifton 1889, P.B. Brodie <1896, W. Wallis 1897, Mr. Douglas M.P. 1901, A. S. Kennard 1903, W. Brotherton 1905, S. H. Warren <1919, L. F. Spath, A. G. Davis 1925-48, A. G. Wrigley 1925-48, J.C. Brookshaw 1926, W.H. Beer 1926, G.F. Elliott 1936, A. Hayes 1937, L. R. Cox 1938, Edmond M. Venables 1946, P. Barratt 1956, David L. F. Sealy 1958, Frederick C. Stinton, J.L. Simons 1960-6, Keith Redgewell <1966, L.T. Mottram 1961, H.E. Taylor 1962, R. Chandler 1968, Alan R. Packman <1972, John Cooper (23 specimens) 1969-90. The following specimens are additional to those listed as private collections: Christopher King 1969, London Transport (6) 1969, Adrian J. Rundle 1980, John P. James (2) 1970-74, Robert I. Kirby 1971, K. Altfield 1974, J. Blake 1975, Brian A. Williams <1977, David J. Kemp (2) 1975, Edmond J. Jarzembowski 1983, J. M. Dring 1986, K. Altfield from Boyer's pit 1990.
- 7 *Queen Mary and Westfield College, Mile End*: Sheppey *Cimomia* 476 (also ?474) from Saffron Walden Museum ?18th C., N.T. Wetherell *Cimomia* from Whitechapel Museum 1848, late 19th C.
- 12 *Royal College of Surgeons of England*: lost in 1941. One of J. Hunter c.1760, rest c.1840
- 15 *Royal Holloway and Bedford New College, Egham*: King's College London 1836, No.1104 is <1867, J. Tennant <1881; Bedford Ladies College 1899 and similar age; Chelsea College c. 1830, late 19th C. Early 20th C. from "Bracknell".
- 1 *Greenwich University, Bigland*: St. (late 1970s)
- 1 *The Museum of London*: ("London" specimen 1913)
- 1 *University College London, Gower Street*: G.B. Greenough Coll. The Richmond or Sheppey *Cimomia* GC41, Highgate *Cimomia* GC38 and Sheppey *Simplicioceras* GC39 are c.1810 or older. J. Morris 1836, "Ross cabinet" 1836, 19th C. teaching collection, 20th C. ex Geological Survey.
- 3 *University of London Schools Examination Board (at Imperial College)*: pyritic casts Bognor c. 1950
- 1 *Wimbledon Society Museum*: (Mr. Short, New Malden 1918)
- South-west London and Kent**
- 11 + 1 *Canterbury Museum (including Whitstable Museum)*: Sir John Tilden <1826 may be 260 a sectioned Bognor *Cimomia*, local *Euciphoceras* mid-19th C., C.R.A. Martin 1935, H.L. Read <1979, enquiry 1990.
- 3 *Dartford Museum*: ?Whitstable 20th C., A.T. Olsen 1957, Mr. Astin 1968.
- 2 *Dover Museum*: Late 19th C. via J.W. Walton (died 1947).
- 3 *Greenwich Borough Museum, Plumstead*: No. 23 (sectioned) and 89 mm diameter "N. sp." of late 19th C., and 39.265 1939. Royal Artillery Institution, Woolwich (pre 1864), with three additional Sheppey specimens obtained by Capt. Cockburn and others, found later by Andrew Cryrell.
- 3 *Herne Bay Museum*: Local finds by J.E. Cooper c.1934, R. Field 1970
- 7 *Maidstone Museum and Art Gallery*: Sheppey specimens of Paine late 19th C. and (1) 1944.
- 2 *Rochester Guildhall Museum*: Royal Engineers Collection of Brompton Barracks in Chatham <1911 are late 19th C. Sheppey
- South coast of England**
- 5 *Booth Museum, Brighton*: Late 19th C. Sheppey specimens of Dr. Davies
- 1? *Bournemouth Natural Science Society, Christchurch Road*: Vera Copp may have discovered one since visit.
- 6 *Cumberland House Museum near Portsmouth*: R.W. Hooley 1838 and late 19th C., T. A. Getty 1973
- 0 *Gosport Museum* (see D.J. Kemp coll.)
- 9 *Hampshire Museums*: W.H. Curtis from Newnham 1838 owned by Curtis Museum in Alton. The 8 specimens from the early 20th Century Willis Museum in Basingstoke are ?1838 Newnham.
- 3 *Horsham Museum*: Two early 20th C. Sheppey, one? Bognor
- 3 *Littlehampton Museum*: Two c.1930, Mr J.G. Turner 1934 (Hewitt 1992)
- 4 *Portsmouth University*: C.I. Gardiner and one Isle of Wight late 19th C.
- 1 *Royal Albert Memorial Museum, Exeter*: A.M. Champernowne late 19th C. Sheppey
- 1 *Royal Collection, Osbourne House* (see text, 1869)
- 1? *Southampton University*: A brown "N. elegans Eocene", needs further study

5 Winchester Museum (Hyde Historic Resources Centre): R.W. Hooley late 19th C., Frederic C. Fox < 1960

West of London

1 Bristol University: S.H. Reynolds early 20th C.

19 City of Bristol Museum and Art Gallery: J.C. Pearce and R. Etheridge c.1840 (should perhaps be c.1810), 4th Earl of Ducie mid-19th C., probable Bognor *Cimomia*, specimens via William T. Gordon are late 19th C.

5 National Museum of Wales at Cardiff: Late-19th C. specimens including one via F. H. Butler 1913, Bracknell *Cimomia* of F.J. North <1914, Wokingham *Cimomia* of J.K. Blundell early 20th C.

23 Oxford University Museum and teaching collection: W. Buckland coll. may include L.597 from Regents' Park (presumably 1816), L.585 showing an association of *Simplicioceras* and a crinoid, and L.596 which he labelled "-aneham, Murrell Green, Basingstoke 1837" (Nuneham). Most specimens appear to be from Sheppey in mid-19th Century. Also J. Spearing (1) 1984.

9 Reading Borough Museum: Late 19th C. Sheppey and local early 20th C. *Cimomia* including one from Wallingford Castle Museum, R.K.S. from Binfield 1937, Robin Deakin from Wraysbury Reservoir 1968. The 327 mm diameter *Cenoceras* dug up from King Edward VII Avenue in Windsor during 1967 is Upper Lias.

8 Reading University (PRIS at Whiteknights): F.H. Butler, W. Whitaker and Wokingham *Cimomia* early 20th C., Dr. Ronald Goldring from Arborfield c.1960.

3 Stroud District (Cowle) Museum: C.I. Gardiner and other late 19th C. Sheppey

Museums near the northern London Clay

1 Hertford Museum: Mr M. Alexander presented a *Euciphoceras* from "25 foot level at Cuffley", in 140 foot shaft Bayford Tunnel 1913.

7 Ipswich Museum: Two Harwich specimens listed in the 1896 catalogue were not examined. Two *Euciphoceras* from Walton or Frinton including the find by Mr. A. Martinelli in 1895, Welfare 20th C., Robert A.D. Markham 1960s.

5 Norwich Castle Museum: Rev. F.A. Buxton 1888, one 20th C.

79 Sedgwick Museum and teaching collection, Cambridge: J. Woodward c.1700, T. Image ?1800-30, H.E. Strickland 1836, T. Wiltshire mid-19th C., C.J.A. Meyer 1862 and 1869, (?G.H.E.) Walton, F. Butler, W.H. Shrubsole 1893, A.M.A. Marjendie 1949.

Central and northern England

1 Bedford Museum: Newnham 1837? via P.G. Langdon c.1920.

49 British Geological Survey, Keyworth and London: Geol. Soc. Coll. G5a 742 from Walton in Essex 1835, GSD 3125 D. Sharpe <1850 *Cimomia*. Geological Survey Museum: W.H. Curtis 1838, E. Forbes <1854, N.T. Wetherell 1848 and ?1865, R. Gausson 1850, F. Gordon 1884-95, W.S. Crimp 1885, F. Chapman 1886, J.M. Blake 1888, G. Dixon 1899, G. Gilbey 1904, A.G. Davis 1925 and ?1936, T. Cook & Sons Ltd. 1925, — 1928, Southall boring 1936, A.J. Young 1951, J.R. Blagg 1955, L. Kemp 1956, Woodford Waterworks 1969.

3 Birmingham University: Min. Inst. 226 and other late 19th C.

2 Bolton Museum: late 19th C. via Ann Holden.

4 Leicestershire Museums, Leicester: Mr J. Hart 1836 to <1850, Percy Faulks <1951.

2 Liverpool Museum: via Chester Museum mid-19th C., via Kendall Museum 1848

13 Manchester Museum: "Bognor Beds", (?G.H.) E. Walton, Mr Fielding 1870, Mrs G. L. Banks 1895, ? E. Bird 1889.

5 Northampton Central Museum and Art Gallery: Second Marquis of Northampton (four largely unlabelled and Bognor specimens could have all come from Bognor when the Marquis collected fossils near there in 1849. But found with a Sheppey *Cimomia* labelled "Nautilus-nacre Col 79").

2 Peterborough Museum: unlocalised mid-19th C. Burghley Coll.

2 Sheffield City Museum, Weston Park: Rev. J.H. Hewlett at High Barnet 1870, W.H. Shrubsole 1880.

2 Sheffield University: from Elstree 1867 and late 19th C.

5 Warrington Public Library and Museum: A. Robertson <1853 and late 19th C.

3 Wisbech and Fenland Museum: ?J. E. Weatherhead 1836, other mid-19th C.

4 Wollaton Hall, Natural History Museum of Nottingham: J.E. Weatherhead 1836, ? J.W. Carr late 19th C.

12 Yorkshire Museum: J. Brown c.1835, (?S.V.) Wood 1836, W. Reed 1854-64, J.W. Elwes 1888.

Scotland

13 Hunterian Museum, Glasgow University: ?J. Parkinson, G.A. Mantell c.1812, J.T. Day 1867, W.H. Hudleston 19th C., ? Thomas J. Dowling early 20th C.

2 Kelvingrove Art Gallery and Museum, Glasgow: (?1848)

3 Royal Museum of Scotland, Edinburgh: "Highgate" ?c.1830, "Harrow Weald", Dr. Easton 1859.

Ireland

20 National Museum of Ireland, Dublin: H. Joy c.1830; 1848 and Sheppey specimens probably largely of N.T. Wetherell via British Geological Survey 1852-6.

6 Trinity College Dublin, Geological Museum: (mid-19th C.)

COLLECTION MANAGERS: THE FINAL INSULT?

by Simon Knell



Knell, S.J. 1995. Collection Managers: The Final Insult? *Geological Curator* 6(3): 125-127.

Museums throughout the UK are now appointing collection managers. This is a simplistic response to the demands of Museum Registration. Museum Registration is itself a response to the specialist reports of the 1980s which revealed neglect. Specialist groups such as GCG have argued for more specialist curators in order to reverse this decline. The museum response, however, is the appointment of yet more generalists which threaten to further undermine specialist curation.

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The debate over who should manage museum collections is fairly recent, and gained considerable media attention a few years ago when research staff at the Natural History Museum, and other museums in South Kensington, found themselves being restructured. The fashion for collection managers this seems to have engendered is now spreading out into the provinces where new posts are being created and old ones redesignated. The 1994 numbers of *Museums Journal*, and its jobs supplement, demonstrate a rapid increase in vacancies for this type of worker. Why do we need collection managers now? What does this mean for specialist curation in provincial museums? Has collection management at last achieved recognition or are there hidden costs?

In his book, *Professionalising the Muses*, (AHA Books, Amsterdam) Peter van Mensch (1989) sees the subdivision of responsibilities as an inevitable consequence of the expansion of the profession. As a result: "the traditional tasks of the curator are hived off, in some cases leaving only his scholarly work. He has to stand by helplessly while his domain is curtailed and his influence diminished". The underlying impetus for the 'professionalising' of collection management in provincial museums has come from the now familiar reports of the 1980s, of which Philip Doughty's (1981) *The State and Status of Geology Collections in United Kingdom Museums* (Geological Society Miscellaneous Paper 13, London) was the first and most influential. Doughty's evangelising spread the word beyond the bounds of geological curation. So effective was it in giving museum geologists the moral high ground, especially when arguing for extra resources, that other groups soon sought to emulate it.

This and other reports of the past decade have provided the Museums and Galleries Commission with considerable material on which to base its response. As we now know, that response centred on the establishment of standards both through the Museum Registration Scheme and the new "*Standards in the Museum Care of...*" documents which many GCG members helped formulate. Registration, which has initially established very basic targets for collection care, is designed to enable the progressive raising of those standards. But is registration proving effective because the profession, or the museum funders, have suddenly seen the light or because failure to comply places both museum status and grant-aid in jeopardy? The widespread appointment of collection managers is undoubtedly a result of this arm twisting but it is also becoming something of a fashion amongst museum managers.

Ironically, the research on which all this is based was sponsored by specialist groups representing the interests of museum geologists, biologists, social historians and others, who saw the appointment of more specialists as the most effective solution to the problems the reports revealed. Indeed, one result was to temporarily make available peripatetic geological support to museums in some area council regions. If the long-term outcome is, however, the appointment of more generalist collection managers then surely all this evangelising will have (indirectly) backfired.

A cure to the problem of collection neglect relies on an understanding of its underlying causes. While the establishment of standards appears an effective remedy it does not require this understanding. After all standards are what the military use to create a disciplined fighting

unit but shiny buttons and boots have little to do with the origins or realities of war. In 'systems' jargon the approach to neglect is to treat it as a 'black box' - opaque to our understanding. We know that good collections enter the museum and that years later they are found in chaos but we don't confront the causes of this transformation. Certainly, we are increasingly understanding the mechanisms of decay (damp, pests, etc.) but these are the symptoms of neglect not the causes.

When other areas of museum operation have come under scrutiny, and it has been felt that standards can be raised, the result has been the 'professionalising' of that function. From the need for greater didacticism, education officers were appointed; as we better understood the scientific and ethical complexities of remedial conservation so conservators were added to the team. The workforce has been progressively transformed from a body of collection-oriented curators into one consisting of educationalists, conservators, marketers, exhibition officers, designers and museum managers. A result of museum expansion and changing social context, as Van Mensch suggests, but equally a reflection of attempts to raise standards. The addition of collection managers, in their various guises, simply follows this same pattern of professionalising tasks.

For the museum manager pursuing this 'functionalist' or task-oriented philosophy, establishing and monitoring standards is much simplified when compared to the management of a staff of specialist curators. The activities of the latter are more fluid and less easy to define - they seem to overlap and are so wide-ranging they can be difficult to monitor or manage.

There is a useful analogy here in the digital workforce which now shares our offices and stores. Computers have developed from simple desktop machines which undertake actions in series to modern supercomputers capable of 'multitasking' and parallel processing. A staff of specialist curators 'multitask' - they have skills which enable them to work simultaneously on a wide range of different activities. They also operate in parallel - each curator works independently and is capable of dealing with tasks similar to, or different from, those of his/her colleagues. A task-oriented workforce tends to operate in series - work is passed from one functionary to another. In terms of processing power it appears that museums are regressing.

Perhaps the problem with the curatorial model is one of management - supercomputers can be difficult to program.

The past appointment of task-oriented staff occurred during a period of expansion in the profession and did not significantly erode core curatorial provision.

However, specialist knowledge is inextricably linked to the functioning and management of the collection. That territory is already being encroached upon. Conservators, for example, ever more smitten with the "hands-off" approach, have left their laboratories and now practise preventative conservation - tasks largely synonymous with much of what is simply good collection management practice. At the same time documentation officers have been employed, in what is otherwise a largely computer illiterate profession, to develop and implement documentation systems, and technology in accounting, publishing, word processing and display. Is collection management really becoming too complex for curators or is complexity being used as a means to enlarge territories?

The strength of the task-oriented approach is in the focus it places on the functions of a museum. The collection manager has the luxury of being single-minded, concerned purely with the mechanics of accessibility and object longevity: data standards, environmental controls, the eradication of pests and so on. The museum geologist, in a local authority museum, for example, probably has greater knowledge of these issues for his/her own discipline, and perhaps equal knowledge in other areas. The new collection managers are invariably drawn from this same curatorial pool but are employed as generalists. The geological curator cannot be single-minded as performance is not measured in tidy stores and numbers of specimens curated. Isolating the collection management function frees that member of staff from the other aspects of curation and may ultimately allow a better understanding of their own area of interest. But does the museum require a full-time collection manager or simply the establishment of efficient working systems which curators can then implement? Does the museum already have the expertise to establish these systems? Could a member of staff be temporarily seconded to this position to get these systems in place?

The implication of the Doughty Report was that curators were unaware of the vulnerability of collections - particularly in those areas outside their expertise. A problem which a geological curator, or even a conservator or collection manager, could resolve. But is this the whole story? These reports did say that geological collections were vulnerable, but more crucially it said they were *important* and *valuable*. It had been assumed that all that does not glitter is not gold. The real problem was that the material was not *understood* by those who had cared for it. A problem requiring the attentions of a specialist.

Anyone who has delved into the history of museums will be aware of their vulnerability - the cyclicality of support and neglect. Indeed the current period of

museum history is, for many museums, one of extreme concern. Wavering political and financial support for museums is an obvious cause to which to attach blame for poor collection management. Events in Derbyshire and at the Passmore Edwards suggest that what once seemed impossible, or at least a thing of the past, is no longer so. In terms of collection care, fluctuating support leads to understaffing but also to the temporary use of buildings and the regular movement of objects. This is undoubtedly the greatest cause of damage to collection integrity.

These boom-bust cycles experienced by museums are not just a reflection of the national or local economy. They also result from the changing relationship between an institution and its governing body, political swings, patronage by individual trustees or councillors, changes of staff, changes of policy, staff creativity, innovation and selfishness, and fashion. Collections thrive in an atmosphere of stability, not simply in an environmental sense, but in terms of support, policy and practice. Some of the finest historical collections are simply that because they have been subjected to the minimalist school of curation - understood, maintained and used.

To counter fluctuations in support museums have adopted professional marketing techniques in order to raise their public profiles. These tend to revolve around the 'interesting angle' approach of journalism. Collections are not seen as being dynamic or marketable unless they relate to some current item of media interest, in geology this tends to mean dinosaurs, dinosaurs and more dinosaurs. Despite its superficiality marketing does lead to the acquisition of resources which sometimes benefit collections. Unfortunately, its neglect of the primary collecting function of the museum, and of the museum's fundamental service as a cultural archive, means that collections as an entity are not widely understood. It follows that collections management will also be unappreciated and poorly supported. The problems of the past were not a result of the inefficiency of a curatorial system which needs to be replaced by a new order but a failure to recognise the importance of collections and the resources required to maintain them.

Ultimately, poor collection care is directly attributable to the operation of museums by, often small, unrelated and unlinked organisations. They derive few economies of scale which would allow the maintenance of a diverse staff and follow no national or regional strategy.

Attempts are being made to counter this by networking expertise. Whilst this is an imperfect solution, it may enable museums to maintain the diversity of knowledge and skills necessary for their integrity and collection survival.

The establishment of generalist collection manager posts re-asserts a belief in the collection: it represents a new resource and a change of attitude. In many very small museums and some very large museums there are likely to be positive benefits but it would be wrong to see this as a universal cure. There is a risk that in attempting to rescue one sacred cow we may be in danger of sacrificing another: the specialist expertise found in museums is as unique as any collection. To further erode the position of the specialist curator would simply be another step towards the superficial treatment of collections.

There are many occasions when the expertise of registrars, collection managers and conservators is required to maintain collections but collections cannot be efficiently managed by people who do not understand the intellectual properties of the objects they contain. Whether collection managers are acquired through permanent appointment, networking or advisory support depends very much on the nature of the institution, but permanent appointments have hidden costs. The mathematics of declining budgets and new designations must equate to a reduction in certain types of post and the likely result will be fewer vacancies for specialist curators.

Perhaps the appointment of collection managers or documentation officers indicates that museums are not sharing resources and knowledge effectively. Whilst it might simplify the management of staff and the meeting of superficial performance targets, it may not be the most efficient use of revenue funds.

This process began with the professional concerns of those who argued for more specialist curatorship, not simply to enable the better management of collections, but also to see that these collections are understood and used. Now it seems that our concerns may have indirectly undermined the last bastion of the geological curator. Just over a decade ago we learnt that a large part of our geological heritage had been decimated; it would be truly ironic, and add insult to injury, if all our campaigning was ultimately to decimate specialist curation as well.

**RESONANT ROCKS: The Great Stalacpipe
Organ of Luray Caverns, Virginia, U.S.A.**

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Geological Curator 6(3): 128 [1995]

Further to the paper by Catherine Fagg (*Geological Curator* 6(1): 16 [1994]) on resonant rocks I want to draw readers attention to "The Great Stalacpipe Organ" of Luray Caverns, Virginia, U.S.A.

I quote from the guidebook:

"The World's Largest Natural Musical Instrument (Guinness Book of World Records, 1988) is the Great Stalacpipe Organ, found in the Cathedral of Luray Caverns. This unique instrument, conceived by Leland Sprinkle, encompasses three and one half acres of stalactites which were tuned to concert pitch. Music of symphonic quality is produced when the stalactites are electronically tapped by rubber-tipped plungers. The Stalacpipe Organ may be played manually from the console or from an automatic system which operates

similar to a small music box. The organ's plunger-equipped stalactites combine to play such tunes as "Oh, Shenandoah"."

No, this is not a wind-up - it's really true, I was there in 1991 and heard the thing play "Oh, Shenandoah" - ahh, 'tis only in America that you could find such a cultural wonder!

The geology handbook says:

"Luray Caverns, Page County, Virginia, lie at shallow depth in Cave Hill a short distance west of the town of Luray. The enclosing rocks consist of granular crystalline dolomite of Early Ordovician age." [Hack, J.T. and Durloo, L.H., Jr., 1977. *Geology of Luray Caverns Virginia*. Virginia Division of Mineral Resources]

CURATION AND CONSERVATION - THE POOR RELATIONS OF RESEARCH?

by D.N. Lewis and T.S. Foster



Lewis, D.N. and Foster, T.S. 1995. Curation and conservation - the poor relations of research? *Geological Curator* 6(3): 129- 132.

Curation is frequently regarded as a dull and unexacting task suitable for those of lesser knowledge, experience, abilities and intellect. Conservation is considered likewise, usually as an adjunct to the duties of a curator. Without good curation and conservation, the efforts of collecting and research can be completely negated by the loss of data and material.

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Introduction

This paper discusses some of the ways in which curators and their activities are viewed by non-curators. It also discusses the essential importance of documentation.

Definitions

Due to the variations in perception of what curators are and what they do, we propose the following definitions for curation and conservation.

The purpose of curation is: to ensure that specimens and the information about them are available for examination; to add and update information when necessary; to enhance the collections by the addition of new specimens.

The purpose of conservation is to ensure the continued existence of the specimens and the data concerning them.

The definitions can be applied to biological and geological samples as well as art treasures and historical artifacts, with research, curation and conservation all interdependent. One is no less important than any other, though some are more glamorous.

By implication from the definition of curation, we can see that:

A curator is one who ensures that specimens and the information about them are available for examination; who adds information to them when possible; who enhances the collections by the addition of new specimens.

And that:

A conservator is one who ensures the continued existence of specimens and the data concerning them.

Discussion

1) The Myths and Legends

In Britain, the popular image of a curator is of a fusty, perhaps eccentric individual, ensconced in a museum, dusting displayed specimens, cramming them into drawers, and generally living in the past. He (almost always it will be a 'he') will be old-fashioned of dress, possessive of his charges, have a confident knowledge of where things are (or were), and be more or less enthusiastic about what he is doing, though he *may* not be an intellectual giant. His task of curation is usually understood to include the detailed knowledge of and about items in his collections, the repairing of broken items, and the writing of labels to be included with specimens which he will put away in drawers. Some of the labels of the specimens in his charge will be old, yellowed, perhaps brittle and crumbling at the edges, and containers for the specimens will undoubtedly be falling into disrepair. Occasionally he may be called upon to give an exhibition of some of the specimens. Alternatively, the curator is sometimes mistaken to be the uniformed security official seated or patrolling the galleries of the museum.

Other impressions of a curator can also be found in popular novels. For example, in the chapter entitled

'*Time shore of the inland sea*' of '*Jurassic Park*' by Michael Crichton, the outdoor hero of the novel, Dr. Alan Grant, "...had little patience for the academics, for the museum curators,...". Obviously, Grant did not care overmuch what became of his valuable finds once they had been collected, nor presumably the information to go with them if they were not to be properly curated. Perhaps his *fame* as a dinosaur hunter was all he cared about? Unfortunately, such fictional conceptions exist in real life.

There is no popular image of a conservator, which speaks for itself.

Some research scientists regard curation as a pedestrian and pedantic activity. They refer to curators in a somewhat condescending, dismissive fashion: "Oh, he is not a scientist, he is a curator" is a likely description of a curator by a research worker. Or perhaps they will make the distinction between: "...scientists and curators...", when what is actually meant is "...research workers and curators...".

Similarly, conservation, when it is thought of at all, can be regarded as a dull, if necessary, lightweight activity, tagged on as an adjunct to the duties of a curator. Certainly curators undertake some conservation, but conservation is nowadays a highly specialised subject, requiring a knowledge of chemistry, physics and, if natural history specimens are involved, biology. Conservators are specialists in their own right.

2) The Reality

These images of the curator are outdated of course, and are the views of those who are unaware of, or who have simply just not understood, the roles of conservator or curator. Administrators, both in museums and outside, appear to have difficulty grasping the idea that it takes curators a long time to get to know large collections properly, and persist in their beliefs that only low-graded, unqualified staff *need* be employed for the tasks. There is a misconception by them also, that once trained, a curator can curate *any* collection efficiently without further ado. There is a wealth of difference between knowing where in the collections a specimen can be found, and of knowing its importance and relevance to any associated material. The difference between them is of the shorter learning and training period compared with the experience gained over time, perhaps longer than five years. A research scientist can be saved much time and effort by a curator recognising the importance of other material in the collections.

Unfortunately, in larger museums and other institutions with collections to be looked after (for example, universities), the curator is unlikely to be found near the top of the organisational tree, and so has little chance of

influencing directly either national or internal policy towards collections and those who look after them. These positions are maintained by administrators or researchers, and the greater advancement in a career is accorded to them. This may in part be due to the current emphasis towards researchers bringing in additional funding.

In smaller institutions, although curators frequently have more influence, they also have more varied tasks to perform. Thus, curation continues to be perceived as a low-grade affair and the myths about the curator are perpetuated.

Today, many curators and conservators entering museum work are young people, some of them women, who want to encourage the proper use of collections. They may have, or may be studying for, science degrees and other relevant qualifications, and may be publishing original research, contradicting the assumption by some that curators and conservators are not scientists.

The idea of being in charge of collections with yellowed, hand-written and crumbling labels and decayed containers is also outmoded. Acid-free paper and card boxes are preferred for labelling and containing specimens, and routine checks are made on the collections to check for and to prevent or remedy decay, with the danger areas being 'flagged' in some way.

3) Hazards and Remedies

Registration of specimens is becoming much more computer-based, with labels and register pages printed automatically to required specifications, along with any required indexes. These methods have the additional advantage that new copying errors will not be introduced every time the information is duplicated; the information copied by the computer will be exactly the same as was originally entered. Of course, great care has to be taken to ensure that when data are entered into a computer data-base, they are correct, or errors will be duplicated. Using manual methods, not only can original errors be perpetuated, but also new errors be introduced each time a copy of the original data is made.

Computer-based registration has the additional advantages of being accessible to workers in other institutions via a network such as 'World Wide Web' which will supply not only the information about specimens but also images as well. This is at present in its relative infancy and only time will tell if it will be really useful.

Curators have also to be aware of published research findings and taxonomies in order that the collections can be organised in the most effective way. This improves the retrieval of specimens from the collections, so that in an organised system, one specimen amongst

thousands can be found within a few minutes. Such knowledge of a collection is acquired over many years of experience. Researchers rely on curators to provide information, to obtain relevant specimens from the collections, and to update the documentation concerning the collections, such as labels, register pages and indexes, as a consequence of research work. This is an interactive relationship between research and curatorial scientists.

It is desirable that, where possible, curators should also undertake research. This has the advantage of ensuring that they understand fully the requirements and the difficulties of research scientists, thereby making them more sympathetic to research needs. Research by curators will also broaden their appreciation of their collections.

Research workers often give curators specimens in fieldwork state and curators have to sort the information and associate it with the correct specimens. If this is not done carefully a researcher may waste time producing incorrect findings. For their part, good researchers will supply complete data together with the specimens, thereby removing the subjective opinions of others who, however well-intentioned, may not actually have collected the material. Some researchers see curators as the link people who will be able to tell them the essentials they need to know about a specimen.

Curators have found published some sloppily presented research. Perhaps the author was in so much of a great hurry to get the work finished and published, maybe because of publishing deadlines or from pressure to produce papers, that no trouble was taken to ensure that the material was properly labelled. In palaeontological literature there are instances where the author has given the same catalogue number to completely different taxa. Sometimes a specimen is referred to by its registered number, and so it can be unclear as to which of the specimens bearing the same number the author refers. An occasional typographic error is understandable, if undesirable, but large numbers of errors which are not typographic but are the result of carelessness, confusion or indifference are not acceptable.

If published mistakes are not noted and recorded at this stage, the errors may be perpetuated by being copied into registers and other specimen documentation, even to the extent of being accepted as the truth. Anyone reading a publication or referring to a register or label can be excused for believing that what is recorded is correct, and thus the wrong information may be used in future work.

Fortunately, the curator is able, by being pedantic, to spot these errors and include corrective notes with the specimens and the cataloguing. Checking and correcting

the errors is very tedious and time-consuming, even with the aid of computers. However, although all the errors may have been identified, and notes included with the specimens and documentation, the curator is unable to affect the publication itself. Sometimes, therefore it can be useful to let the curator proof-read the manuscript if time permits.

The conclusion that other scientists *could* draw from these errors is that the research presented was also suspect in its findings. If the simple task of assigning the correct number to a specimen has not been carried out accurately, has the more demanding task of scientific investigation been carried out properly? At this point we have to ask:

What is the purpose of the research if the findings cannot be checked by others because the work is poorly presented, or the information or material is lost because of inadequate conservation of documents and specimens?

There is a good case to be made for all scientists who work with collections, either their own, or those of museums/colleges, to undergo proper training in *basic* curatorial skills early on in their undergraduate studies. This would ensure that their data were related to the relevant specimens, and that care was taken to record accurately the curatorial information, not just the research findings, when writing scientific reports for publication or otherwise. It would also reinforce the necessary discipline to work in an ordered progression, which is advantageous to research as well as curation.

A collections-based scientist also needs the elementary, even mundane, skill of being able to write neatly and legibly. Labels which are illegible scrawls are as useless as those which become illegible through decay, as examination of some of the originals in museum collections will show. The illegibility is not confined only to labels written in the last century, so changes in the *styles* of handwriting cannot be blamed. Contemporary relabelling in neater writing means that information is not lost - the curators of the time can probably read the style and type of scrawl, or perhaps are able to consult the writer, or are experienced in deciphering certain handwriting. But if any of this is not possible, information may be hidden, perhaps forever. We must all realise that there will inevitably be changes in the style of writing over long periods of time, and that neatness of handwriting and other methods of recording data to enable future readers to understand what was written, are essential.

Conclusion

It is essential that research, curation and conservation are recognised as an *integrated* activity, requiring the

skills of each kind of specialisation, leading to one common goal - the furtherance of our scientific knowledge. Importantly, conservators ensure that both specimens and documentation *remain* available and safe.

Yes, the work of curators *is* pedestrian - they work steadily and thoroughly. If they hurry they can make errors. And yes, they *are* pedantic - they take care to be as accurate as they can be. They have also to try to appreciate what they are curating and how it relates to other research and information. Because of their experience and interests they are frequently able to discover a taxonomic problem, research upon it, and resolve it. This is especially important where staff shortages mean that there is no specialist research worker.

To all those scientists who do hold curators and conservators in low regard it can be said, "Think again, for *your* reputation can be damaged if your specimens and your published data do not match or are lost because of decay."

And of those who cannot understand why curation should be so important and curatorial experience so valuable and necessary, we can ask, "If the collections are lost through neglect and indifference, and nothing is left, what would *you* do?" Museums have a responsibility and duty, moral as well as legal, to safeguard the collections which are in their care and which have been presented in good faith, or have been acquired using public funds. Lose them at your peril.

Acknowledgements

We acknowledge with thanks Drs. Paul D. Taylor (Natural History Museum) and Stephen K. Donovan (University of the West Indies) for their helpful comments made during the progress this paper.

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LUCAS BARRETT'S COLLECTION: JAMAICAN ECHINOIDS HIDING AMONGST BRITISH IMMIGRANTS

by Stephen K. Donovan and Sharon J. Wood



Donovan, S.K. and Wood, S.J. 1995. Lucas Barrett's collection: Jamaican echinoids hiding amongst British immigrants. *Geological Curator* 6(3): 133- 135.

The collection of Lucas Barrett (1837-1862), first director of the Geological Survey of Jamaica, is housed in the Geology Museum at the University of the West Indies, Mona, and includes nine tests of spatangoid *Hemiaster* sp. These most probably come from the Upper Cretaceous of the Blue Mountain Inlier in eastern Jamaica. These fossils provide additional data on the echinoid fauna of Jamaica's most inaccessible inlier; they preserve some fine morphological features rarely seen in specimens of this species; and they represent the first 19th century collection of Jamaican fossil echinoids to be re-evaluated in the 20th century.

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Introduction

Although the group was first reported from Jamaica during the 19th century, monographic studies of fossil echinoids (and, indeed, many other taxa) from the island were not published until the 1920s and later. These studies were based on large, new accumulations, made by such notable collectors as C.T. Trechmann (see Hawkins 1923, 1924) and B.W. Arnold (Arnold and Clark 1927, 1934). Unfortunately, specimens of Jamaican fossil echinoids collected during the 19th century were not used in these later studies and subsequently have been ignored or lost. Many of the older fossil echinoid localities from the island are, in all probability, now either overgrown or eroded/quarried away, and information derived from their specimens concerning, for example, morphology and species distributions remains undocumented.

Although the Geology Museum, University of the West Indies (UWIGM) was only opened to the public in 1969 (Wood 1995), it does own one notable 19th century collection, that of Lucas Barrett. The Lucas Barrett collection of rocks, minerals and fossils, from Jamaica and England, was acquired by the UWIGM from the Sedgwick Museum, Cambridge, in 1975 (Draper 1976). Lucas Barrett (1837-1862) was the first Director of the original Geological Survey of Jamaica from 1859 until his death, while diving in Kingston Harbour, in 1862 (Chubb 1962). Since being acquired from the Sedgwick Museum 20 years ago, Barrett's collection has not been utilised as a research tool. As a part of the continuing programme to improve the facilities of the UWIGM by S.J.W., the authors determined to fully catalogue the

fossil echinoderms in the Barrett collection, a study related to current research by S.K.D. It is also relevant to note that the echinoderms were a group of particular interest to Barrett, forming the subject of three of his publications (Barrett 1857*a, b*; Barrett and M'Andrew 1857).

Most of the fossil echinoderms in Barrett's collection are from the British Isles. These include the thecae of two Lower Carboniferous camerate crinoids, and 28 tests of echinoids from the Cretaceous and Jurassic. However, UWIGM LB 7265 is a collection of 10 specimens, comprising the internal mould of a crab carapace and nine spatangoids (heart urchins) which are identified as being *Hemiaster* sp., conspecific with the form known from the Upper Cretaceous (Campanian-Maastrichtian) of Jamaica (compare Figure 1 herein with Donovan 1993, fig. 12).

Discussion

The discovery of these Jamaican Cretaceous echinoids in Barrett's collection is of interest for a number of reasons. They provide additional data on the echinoid fauna of Jamaica's most inaccessible inlier, they preserve some morphological features rarely seen in specimens of this species, and they represent the first 19th century collection of Jamaican fossil echinoids to be re-evaluated in the 20th century.

Although there is no locality or horizon data with these specimens, they are preserved in a brown, fine- to medium-grained sandstone typical of many Jamaican, Upper Cretaceous sequences. Barrett's Jamaican rocks were collected from eastern Jamaica (Figure 2) and it is



Figure 1. *Hemiaster* sp., Upper Cretaceous, probably Blue Mountain Inlier of eastern Jamaica. (A) UWIGM LB 7265[1]. (B) UWIGM LB 7265[2]. Note peripetalous fasciole preserved adjacent to petal in ambulacrum IV (at '10 o'clock'). Scale bars represent 10 mm.

reasonable to deduce that these echinoids are from the Blue Mountain Inlier of that region, the largest of the 27 Cretaceous inliers on the island. Barrett (1860) made an important contribution when he redated these rocks as Mesozoic rather than Palaeozoic, based on biostratigraphic evidence. However, despite its size,

this inlier remains poorly studied geologically as it is largely inaccessible due to dense vegetation and the mountainous terrain (Blue Mountain peak is at an elevation of 2,254 m). Unmetamorphosed sedimentary rocks within this inlier are Campanian to Maastrichtian in age (Krijnen and Lee Chin 1978; Robinson 1994, fig.

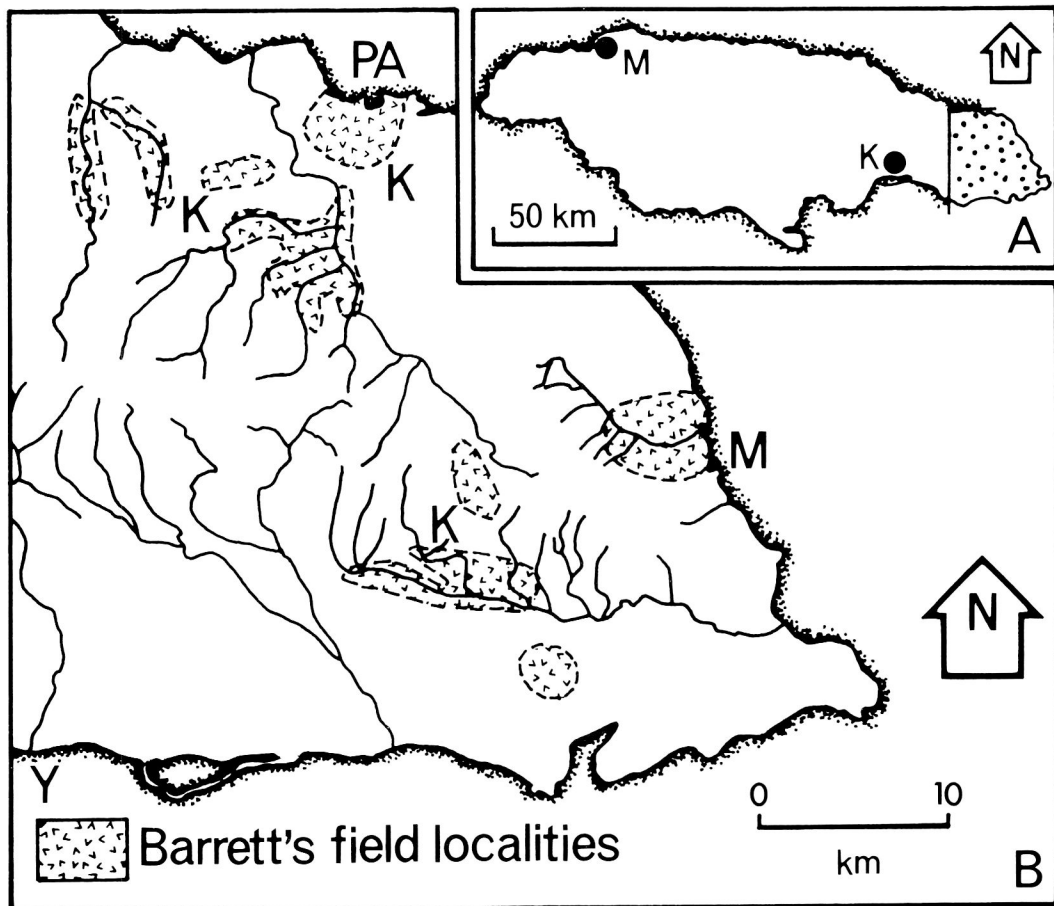


Figure 2. (A) Outline map of Jamaica (coastline stippled), showing the approximate position of the main map (open stipple) in eastern Jamaica. Key: K=Kingston; M=Montego Bay. (B) Map of eastern Jamaica (redrawn after Draper 1976, fig. 1), showing Lucas Barrett's principal field localities, based on labels of specimens in Barrett's collection; those which occur in the area of the Cretaceous Blue Mountain Inlier are indicated (K), as are principal rivers. Key: M=Manchioneal; PA=Port Antonio; Y=Yallahs.

6.4). *Hemiaster* sp. is the most widely distributed echinoid taxon in the Jamaican Cretaceous (Donovan 1993, table 1). While this was previously known from the Blue Mountain Inlier, the combined collections by C.T. Trechmann and S.K.D., made south of Port Antonio, parish of Portland, include only about 20 specimens. It may be significant to note that some of Barrett's rock samples came from this area (Figure 2). This species remains the only Cretaceous echinoid known from eastern Jamaica.

These specimens show the preservation most typical of this species, tests being crushed and/or preserved as moulds. This low preservation potential has previously prevented this species from being adequately diagnosed and it is uncertain whether it represents a new taxon or should be assigned to one of the 50-60 species of *Hemiaster sensu lato* (A.B. Smith, personal communication) known from the Maastrichtian. However, in some instances Barrett's specimens do retain fine structures such as peripetalous fascioles (Figure 1B). These specimens thus provide morphological data that will be important when this species is revised and formally redescribed (S.K.D., research in progress).

Jamaican fossil echinoids were being studied at least as long ago as the mid-19th century (Michelin 1856). However, as explained above, these early collections have been either ignored or lost (for example, Hill (1899, p. 118) documented *Salenia* from the Blue Mountain Inlier, a report that remains unconfirmed). The biogeographic and morphologic data obtained from Barrett's collection illustrates the potential value of these old collections, and the authors are currently searching for other 'lost' Caribbean echinoids collected in the 19th century.

Conclusions

A rare collection of fossil echinoids from Jamaica that was made in the 19th century has been identified in the UWIGM. These specimens were collected by Lucas Barrett, presumably from the Upper Cretaceous of the Blue Mountain Inlier, eastern Jamaica. This is the largest of the Cretaceous inliers in Jamaica, but is poorly accessible, so the fossil fauna of this area is still imperfectly known. Although not well preserved, some of Barrett's specimens retain delicate morphological features, such as fascioles, that are poorly known from this species.

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BOOK REVIEWS

Nudds, John R. (editor and compiler) 1994. *Directory of British Geological Museums*. Geological Society Miscellaneous Paper 18, 141 pp. ISBN 1 897799 08 X. Paperback. Price: £14.95.

It is often hard for a museum to evaluate quickly the strengths of its collections or displays in comparison to those of other institutions. This difficulty can have serious consequences, for failure to appreciate the value of a collection can result in serious mismanagement. Similarly, it may often be difficult for geologists (both amateur and professional) to find information on museums in their areas and about these institutions strengths in exhibits of geological interest and as repositories. In order to address these needs the GCG has produced a directory of museums. The finished product is a brief and reasonably priced compendium of the major public collections and displays throughout Britain, Ireland, and the Channel Islands (and not as strictly "British", as its title implies) which provides a handy summary of each institution.

A series of headings provide the reader with information covering the location (with the welcome detail of Fax numbers in many instances) and admission to each museum, the public displays and educational programmes featuring geological materials, and the strengths of the collections. Collections receive the greatest attention, with details of important donations, the numbers of specimens (in most cases split into fossils, mineral, and rocks, often with numbers of types and figured specimens), published catalogues, research facilities, staff, and a brief history of the institution. It was delightful to learn how many institutions have significant collections, and that most museums have at least one individual whose responsibilities include overseeing geological materials. It was also interesting to learn how many museums began as local natural history societies or field clubs in the middle of the last century, to see the similar pattern of transfer to public ownership via local government, and to learn details of their current funding. I found both the number and variety of institutions both surprising and heartening. An appendix lists other museums housing geological materials, not detailed in the main text. It would have been useful to know why they did not have individual entries. Were they too small or poorly staffed, or simply those that failed to respond to the survey? Although this reviewer is unsure of quite how comprehensive the Directory actually is, it appears to be thorough.

Collections which do not incorporate public displays were not included in the Directory (although the BGS collections were covered). This decision was understandable but also regrettable because many substantial collections are held in universities. Without this information it is not possible to use data in the Directory to estimate the total numbers of specimens held in collections in the region. A more detailed overview of the findings of the compilation, providing the reader with a ready basis for the comparison of different museums, would also have been useful. Other areas that might have been covered included discussion of specimen records, and the degree to which collections are computer-catalogued. It would also be useful to know which software systems are in use. Ready accessibility to specimen data is a critical aspect of the curation of collections, hence this information is becoming increasingly important, especially as museums start to share information electronically.

These omissions are minor compared to the overall strengths of the Directory. This project is a major achievement for the GCG, and all involved deserve congratulation. I wish that a similarly handy guide existed for museums in this country.

Nigel Hughes, Geier Collection and Research Center, Cincinnati Museum of Natural History, 1720 Gilbert Avenue, Cincinnati. OH 45202. USA. 6th January 1995.

***A Resumé of the publications of the Ordnance and Geological Surveys of England & Wales, with indexes to the 1-inch maps of the British Isles, and a supplement on methods of map mounting.* Edward Stanford 1909. David Archer Maps and Books, facsimile 1994, 74 pp. ISBN 0 9517579 4 6. Paperback. Price: £6-92 (post free). Available from David Archer Maps and Books, The Pentre, Kerry, Newtown, Montgomeryshire SY16 4PD, Wales, U.K.**

It always fascinates to turn to the back of a Victorian/Edwardian book and discover several pages of information about 'other books in the series'. A brief resumé of the content and purpose often takes you far beyond what would have been conveyed by the title alone. Then there is the price. A book which you have bought secondhand, "spine a little defective" for £7-10, originally might have cost at most 2/-! All of these thoughts come to mind when scanning the pages of this neat facsimile of what at the time was a catalogue of the services offered by Edward Stanford, 12, 13 & 14, Long Acre.

The name stands alongside Thomas Cook or Wallace Heaton of a slightly later period as synonymous with maps (in this case) and something of a household word until quite recent times. The Resumé was a repeated summary published between 1897 and 1912, at pains to stress that Edward Stanford and no other, was the Official Agent for the sale of Ordnance and Geological Survey maps, anxious to avoid the "Inconvenience to customers that has arisen through confusion with other so-called "Ordnance Map Depots"".

In the pages, here completely reproduced, there are many signs of the times in terms of services offered and details of the content of maps of Counties and built-up areas, which could trigger short papers for the popular journals of today. But the substance of the reprint are pages listing the series of maps by number, and the appropriate price code. As such, this booklet could be of considerable value to map curators who have in their collections, some of the hand-coloured 1" maps of the Geological Survey published between 1860 and 1900. Where do those sheets fit into the sum total published? Where are the gaps that might be filled by scanning the book lists of the dealers? The answer could lie in this facsimile. Geological Survey memoirs, those brittle paper-slender booklets with thin paper covers of a greenish-khaki colour tone, are similarly listed. This time it is an alphabetical ordering which in part hides the gaps which still remain. The thought that the Memoir for Northampton & Warwick was available for 8d, while Otterburn etc. (OS 108 SE, cost 2s 6d in 1909 seems to recognise quality in the writing of Hugh Miller Jnr. which we might applaud. Of a truly research interest must be the page offering what were available as "Resumé of Counties, Alphabetically Arranged" (pp. 22-38). Here we are given details of General maps, Parish Maps and Town Plans, some of them official surveys, others from other sources. These, and what are termed "Miscellaneous Maps" (p. 42), could include sources of information which have been forgotten in comparison to the well-known official survey offerings. Is there not mystery in what is listed as: "Aldershot. Aldershot District Manoeuvre Map. In two sheets. Size of each 30x30 inches. Price 1s 6d each. Mounted as one map (Major Ansell's patent) 8s" or, there is: "Thames Basin - Contoured Map of the Thames Basin. Size 40x25 inches; scale of 4 miles to an inch. Sheet 4s; case 7s 6d"

On quite a different tack, there are pages of the furniture which might bring order and display to any good and well-run map collection. Included here is "The Sheridan Map Screen, suitable for a library or public reading room" supported by a lengthy quotation from 'School for Scandal'. The screen was suitable for the mounting of maps and was "recommended to politicians and journalists who wish to follow the course of events in several parts of the world at once".

At £6.92, postage included, this might seem expensive at first glance. It has, however, invaluable worth for the map curator, and as hinted at in this brief review, could be the springboard for several lines of research into contemporary geological investigation and publication. It perhaps was fitting that the Telegraphic Address of Edward Stanford in 1909 was no less than the magic word 'Zeitgeist'. E-mail hasn't quite caught the spirit of those times it seems.

Eric Robinson, Department of Geology, University College London, London WC1E 6BT, U.K. 13th February 1995.

Wyse Jackson, P.N. (ed.) 1994. *In Marble Halls: Geology in Trinity College, Dublin*. Department of Geology, Trinity College, Dublin, 135 pp. ISBN 0 9521066 1 2. Paperback. Price: £8-00 (including p&p from above address).

In editing and in writing much of this book, Patrick Wyse Jackson has done a fine service, not only for TCD but for geology as a whole. Any geologist, with TCD connections or not, would find this a splendid, and in places a sobering or humorous read. The book is in two parts: first, 78 pages on the history of geology in TCD from 1592 to 1994; and the remainder of the work on recollections by students and staff from around the 1930s to the present day.

The Chair of Geology was established in 1843, the third oldest Chair of Geology and Mineralogy in the world, but the editor traces all the teaching and interest in geology back to the 16th Century. The first occupant of the Chair itself was John Phillips and the last the recently-retired Charles Holland. It is through the succession of very distinguished holders of the Chair that Patrick Wyse Jackson traces what can only be described as a captivating story. The Chair holders were Phillips, Oldham, Apjohn, Haughton, Ball, Sollas, Joly, Smyth, Gill, Hudson and Holland. But the text is much more than a list of the achievements of these men: it deals with the times in which they worked, and there are, as one would expect and hope, numerous fascinating anecdotes.

The second part of the book is, if anything, even more captivating: the view of life at TCD as seen through the eyes of staff and students over more than sixty years in this century. There are some distinguished people here, too, including Frank Mitchell, Geoff Larminie and Gordon Davies among others. There are also some quite hilarious tales, such as the flooding of TCD with numerous boxes of condoms, bought in Belfast by feminist activists of the day, including, it seems, Audrey Jackson. I see also that Martin de Wit writes, in measured tones, of his enthusiasm for the teaching he received here. My recollections of Martin are of a wilder man than these notes portray. Clearly he has sobered and matured! Amongst the more sobering stories, distressing even, is Gordon Davies' harrowing description of the destruction of many, many museum specimens during the short period of Gill's holding the Chair. This explains why, since those days, many important specimens in the literature have simply been untraceable. But, you know, we haven't learnt the lessons yet.

In addition to all the above there is an account of the Museum itself, a list of the main collections, an interesting account of the publications record of TCD since its inception, a list of obituary references of all the great men, a bibliography (especially of biographical material and of catalogues), and a list of the whole staff of TCD since 1844, the chairpersons of the Joly Geological Society since its first year (1960) and lists of all the higher degrees obtained in the department. This work as a whole is one of some distinction; and Patrick Wyse Jackson's first part one of considerable scholarship.

R.B. Rickards, Department of Earth Sciences, University of Cambridge, Cambridge, U.K. 15th February 1995 (reproduced with permission from Palaeontology Newsletter 24).

Isle of Wight County Council. 1995. *Guidelines for Collecting Fossils on the Isle of Wight*, 12pp. Price: free (available from the Museum of Isle of Wight Geology, High Street, Sandown, Isle of Wight PO36 8AF, U.K.).

The Isle of Wight has been a major tourist destination for fossil collectors for more than 200 years; indeed it is some wonder that this tiny island still exists! But perhaps what is more surprising is that after so much investigation fossil collecting here still manages to bring to light new, exciting and scientifically valuable material. This, of course, generates still further interest amongst the hammer swinging fraternity and raises complex, and often very politicised, debates about heritage conservation and collecting.

This admirable small booklet, produced by the Museum of Isle of Wight Geology, seeks to make sense out of what is occasionally chaotic. While the booklet encourages the collector to adopt a responsible policy towards collecting, it does not present itself as "advice from the Museum". There is a good reason for this: to many collectors the Museum is seen as an organisation with vested interests in collecting - it is a player; not the umpire. Although the Museum has drafted these proposals, it also consulted a wide range of organisations and individuals and has produced what is a consensus view. The booklet rarely mentions the Museum - only on page 8 is it possible to discern that this was the organisation responsible for its production.

There are many ways that you can encourage collectors to adopt a responsible collecting strategy, of these publication is likely to reach the largest audience. Even here approaches differ. English Nature produced its garish 'cornflake packet illustrated' RIGS leaflets which might appeal to children and families, others have included guidelines in fossil collecting guides, there is also the 'Thumbs Up' leaflet, and many magazine articles in *Geology Today*, *Palaeontology*, and elsewhere. Few booklets focus solely on collecting, as this one does, and treat it as a mature occupation. Here the illustrations are not pictures of "fossils you might find" but b/w photographs of people collecting; we see too few of these. At once fossil collecting is not some childish fetish but something very serious and grown up - perhaps therefore it should be treated responsibly? It also tells us in passing that fossil collecting can achieve something worthwhile - "training", "discovery", "preservation", and so on. "If a responsible attitude is adopted, fossil collecting anywhere around the coast can do little harm and will help preserve the geological heritage of the island"

The booklet is aimed at collectors of all types - and I would assume that this includes the vast majority who probably see themselves not as collectors but simply as inquisitive. In very concise and clear prose it discusses land ownership, safety and the ethical and practical considerations of collecting. There is no jargon here, no real stratigraphy, no diagrams - it is all so simple and yet if the rules are followed they would encourage the creation of individual collections vastly superior to those generally formed by amateurs, field parties, students, etc. They contain nothing new but are communicated extremely effectively. In a few pages the booklet describes how to collect fossils.

A museum must remain at the heart of fossil collecting activity, particularly in an area as rich and important as the Isle of Wight. This booklet, though not too explicitly, places the museum as a publicly owned resource to be exploited by collectors, not as a rival or policing authority.

Simon Knell, Department of Museum Studies, University of Leicester, 105 Princess Road East, Leicester LE1 7LG, U.K. 27th February 1995.

Bevins, R.E. 1994 *A Mineralogy of Wales*. National Museum of Wales, Geological Series No. 16, Cardiff. 146 pp. ISBN 0 7200 0403 9. Paperback. Price: £25-00.

Wales, with its coal and metal mines, roadstone quarries and coastal exposures, has become an increasingly popular hunting ground for today's mineral collectors. The rewards are undeniable; over 340 different species have been found, including 10 species first described from Wales and a further 70 first British occurrences from Welsh localities.

Getting to grips with Welsh mineralogy can be challenging. Most of the literature is scattered through innumerable journals and unpublished PhD theses, and is supplemented by a substantial body of unpublished data shared informally among academics, collectors, museums etc. Richard Bevins's book is especially welcome in drawing together both published and unpublished data to provide a wealth of information about those 340-odd species. It is eminently readable, well-referenced and beautifully illustrated.

A mineralogy of Wales begins with a description of the different mineral occurrences in Wales, from rock forming minerals (illustrated with selected photomicrographs) to the hydrothermal and secondary mineralisation of the Welsh orefields, and minerals of superficial deposits. There are plenty of geological maps showing locations of mines, diagrams of geological features and photographs of sites.

The larger part of the book is devoted to descriptions of the minerals, in alphabetic order, each species with chemical formula, a chemical description with brief notes on paragenesis, and then well-referenced details of Welsh occurrences of the species. Photographs show some of the finest and most interesting specimens in both museum and private collections and are well-captioned.

The book ends with an alphabetic list of around 200 printed sources referred to in the text, and an index which includes both mineral and locality names.

The emphasis of the book is firmly on mineral species. It is less easy to access information about localities and I would have welcomed grid references to help pinpoint some of these. The index is very useful for checking spellings of localities (pronunciation is a different matter!) and deeper delving provides a reasonable overview of the minerals to be found at a particular site. Congratulations go to Richard Bevins on this excellent book. It is a real asset for anyone working with or interested in Welsh minerals.

Monica T. Price, The University Museum, Parks Road, Oxford OX1 3PW, U.K. 27th February 1995.

Hall, C. 1994 *Eyewitness handbooks: Gemstones* Dorling Kindersley, London. 160 pp. ISBN 0 7513 1026 3 Flexibound. Price: £10.99.

This recent addition to the Eyewitness Handbooks series meets the usual high standards of concise, readable text and fine colour illustration we have come to expect of DK publications. In her introduction, Cally Hall explains the science of gemmology and the fascination of gemstone collecting, an activity which need not be restricted to the wealthy. The first section of the book describes the formation and sources of gem minerals along with their various physical and optical properties. It then introduces aspects of gemmology - the faceting, carving and engraving of gemstones, their history and folklore, and their imitation, enhancement and synthesis. A useful colour guide follows; a timely reminder that by the time a crystal is faceted, visual methods alone are rarely sufficient to identify it with certainty. I was surprised to find

epidote among the yellow to brown stones but not among the greens - but such errors and omissions seem to be rare.

The next section is a systematic 'photo-encyclopedia' of natural gem materials. It starts with the precious metals, then covers the gem minerals in crystallographic order, and ends with organics such as coral, jet and amber. Varieties of gem minerals - emerald, aquamarine and heliodor for example - are given separate entries. Mineralogical and gemmological data are confined to colour-coded headers and footers, and the information accompanying the illustrations is well selected and informative. Photographs show both rough and cut stones, with captions pointing out a variety of features. It is interesting that a number of minerals are illustrated only by rough specimens, suggesting gems cut from them must be rare indeed! The book continues with simple tables of properties, the gemstones being listed in alphabetic order. It concludes with a glossary and index.

This is certainly not intended as an alternative textbook for any serious gemmologist, but it is an excellent and accessible introduction to the subject. It has a well-deserved place on my bookshelf and in our museum shop.

Monica T. Price, The University Museum, Parks Road, Oxford OX1 3PW, U.K. 27th February 1995.

GEOLOGICAL CURATORS' GROUP

20th Annual General Meeting

8th December 1993 at the Hunterian Museum, Glasgow.

19 members attended.

1. Apologies for absence

Received from Diana Hawkes, Kate Pontin, Mick Stanley, Tom Sharpe, Peter Crowther, John Cooper, Roy Clements, Chris Collins, Steve McLean, Rosina Down, Gill Weightman, John Martin, Phil Doughty, Kenneth James, Kate Andrews, Mike Taylor, Andy Newman, Steve Tunnicliff, David Devenish, Hugh Ivimey-Cook and Rosemary Roden.

2. Minutes of the 19th Annual General Meeting 1992

An error was noted in point three of the minutes where, on the second line down, Mark Simmons needed to be replaced by Steve Thompson. After this one alteration the minutes were approved and signed by the Chairman as a true record.

3. Matters arising

There were none.

4. Chairman's Report from Paul Ensom

The year has been one of steady achievement for the Group, punctuated by several eye-catching and significant events. From within the Group came both the publication of our new publicity leaflet and the seminar survey. For the former we have to thank John Cooper and Nigel Cunningham for their commitment in bringing this vibrant and quite excellent flag-ship leaflet to fruition. The distribution to as wide an audience as possible falls to Colin Reid who I know will be reporting progress in his report. As PRO he has also been responsible for the organisation of the seminar survey. The results were published in *Coprolite* 12 and Committee will be mindful of your responses. Thanks to Colin for much hard work on this front. From outside the Group (but with significant contributions from within) came the MGC's Standards for the museum care of geological collections. This document must be welcomed by all who strive to curate the wealth of geological material in museums, especially at present when there is such uncertainty over funding and the consequences of local government reorganisation.

Colin Reid took over as PRO in the new year, taking on the existing seminar programme and of course starting to develop his own ideas. He will report on the full programme in due course. I would like to thank him and all those who have been involved in seminar organisation, who have spoken at them, and who have written reports for *Coprolite*. There is no doubt that they are an excellent stimulus and that initiatives can flow from them. In addition valuable contacts are made

between different individuals and organisations. A good example was the Building Stones seminar at the Sedgwick in Cambridge which we hope will lead to the creation of a national database of building stones.

The training of geological curators remains an area of great interest to Committee, especially as the basic training in identification skills imparted to undergraduates, which has always been taken for granted, seems to be in decline. This year it is appropriate that we should thank Bob Toynton of Sheffield University for his input and support over 4 of the 5 years when the joint BCG/GCG courses have been run. Committee are very pleased that Leicester have taken on this training role starting with a course to be run in March 1994.

A nationwide series of geology events in which museums would play a significant part was being considered by committee earlier in the year. This has been overtaken by events. Geology Unlimited in August this year (see *Coprolite* 12) has laid the foundation for similar events in alternate years. In addition the Office of Science and Technology have launched National Science week (18-26th March 1994) in which there are good opportunities for museums to show the flag.

During the year committee have been acutely aware of the non-appearance of *The Geological Curator*, not least because we had expected the issue of two parts early in the new year. I doubt any one here fully appreciates the difficulties which have beset our Editor over the last 12 months or so. As some of you know, Bristol is undergoing a major staffing review which has in turn led to posts being cut from the establishment. Peter Crowther concluded that he should resign as Editor. With great regret Committee have accepted his resignation. We owe Pete a great deal for the tremendous effort he has put into 15 published parts of *The Geological Curator*. In his first editorial 8 years ago he said "The last thing I want to do is preside over the journal's dreary 'sanitization'!". He most certainly has not. He built on the sound foundations of his predecessors and hands on a high-quality publication of which the Group can be justifiably proud. We thank you for the very professional results which have flowed from you and your team, and in that team we include your wife Gill and family. By the end of this meeting we should have a new editor in post and we will be looking forward to the renewal of the regular appearance of *The Geological Curator*.

I am pleased to report that the *Directory of Geological Museums* referred to in the Chairman's report last year should be in print in the near future and we thank John Nudds and John Cooper for their continuing work on this publication.

On the committee front, since the last AGM Phil Doughty has retired from the post of PRO, though contact is maintained. Phil has had a long association with the Group and we are

grateful for his support and hard work given over many years. At the same time Mick Stanley became corresponding member for NSGSD. As a result of these changes 'new blood' came onto the committee in the form of John Faithfull, Colin Reid, and Gill Weightman. Gill has taken on the organisation of the Collector of the Year Award. John Cooper also became a corresponding member for the new leaflet and the proposed Senckenberg Meeting, now scheduled for the autumn of 1995. Tom Sharpe and Monica Price are to be congratulated for maintaining a steady flow of *Coprolite* and for their November issue which I think is the largest 'dropping' to date. Thank you to all those who have contributed; please continue to do so. This AGM sees, in addition to Peter Crowther, four other committee members retire; Chris Collins who has kept the Committee well informed on conservation, Kate Pontin on matters educational, and finally Roy Clements who as founder Chairman has brought a valuable perspective of the Group and its activities. Thank you for your service and very varied contributions. Simon Knell has given sterling support throughout the year despite an enormous workload of his own. I will leave him to report on other committee matters. Finally my thanks to all the officers and other Committee members for their support and enthusiasm.

Peter Davies flew the flag for GCG at *Terre, modeles, musées* at Dijon and reported on the content of the meeting in *Coprolite* 12, for which we are most grateful.

During 1993 the production of *Coprolite* has once again benefited from the sponsorship of Mr Clinton Burhouse and I am delighted to report that he has just said that he will do so again in 1994. His generosity is hugely appreciated by the Group and we thank him for his continuing support.

In my incoming Chairman's letter (*Coprolite* 10) I referred to the importance of the collections we care for. As the year draws to an end I can report that we are talking to MGC and BCG with a view to initiating a report on the use of collections. We hope that the report will underpin a renaissance in the way in which museums and their governing bodies view them.

5. Public Relations Officer's Report from Colin Reid

Besides promoting GCG and its activities the scope of the PRO's post has now been extended to include devising and co-ordinating the Group's meetings schedule, a role formerly carried out by the Group's Secretary.

In 1993 the Group organised four seminars, seven workshops and a concurrent session at the MA conference. Marketing geology in Museums at Bristol City Museum and Art Gallery on 22nd April reviewed the experience of curators in presenting geology to the public and provided a rich source of information from specialists such as museum marketing officers and media presenters. Fossil and mineral fakes and forgeries at Burlington House on 15th July provided a fascinating look at the practices and practitioners of fakes and forgeries, with examples on hand. Regrettably the seminar

attracted a low turnout. In contrast, Building stones: are collections relevant today? on 21st September at the Sedgwick Museum, Cambridge proved one of the best attended seminars of recent years, attracting a number of delegates from outside GCG, notably from the stone industry. Chaired by Eric Robinson, who has since written a lengthy account in the GA Circular, the seminar examined the relevance and future of building stone collections and the development of a national collection and database.

The GCG's Museums Association concurrent session on 15th September Interactive multimedia and natural history display reviewed the use of new technologies in museum education and interpretation.

A series of five workshops was held at the Geological Conservation Unit at the University of Cambridge. These dealt with a range of techniques, including treating sulphide oxidation, cleaning specimens, environmental control and care of sub-fossil bone. On 22nd June a workshop entitled Getting to grips with your mineral collection was held at University Museum, Oxford. Down to Earth: Earth science education without dinosaurs at the Museum of St. Albans on 28th October (cancelled last year due to lack of interest), provided practical instruction on organising educational activities, and developing an educational policy.

Thanks to all our organisers and helpers: Chris Collins, Monica Price, Peter Crowther, John Cooper, Mike Dorling, Phil Phillips, Kate Pontin, David Curry and John Faithfull.

The decline in seminar attendances in recent years has given cause for concern. A questionnaire was included in the May edition of *Coprolite* to gather opinions on the reasons for this decline and to develop a seminar programme which better meets the needs and resources of GCG's membership. The results of the survey were published in *Coprolite* 12.

The seminar schedule for 1994 has been put together after considering many of the points raised by the questionnaire/ notably relevant themes, the desire for more joint meetings with other organisations and the need to justify time and expense for absences from the workplace. Next year's meetings will be in Northampton, a 20th anniversary review and preview of GCG's activities (17th/18th May), the Lapworth Museum, Birmingham on The university collections (13th July), with the AGM at the National Museum of Wales, Cardiff on new direction in geological interpretation (30th November/1st December). A joint GCG/BCG seminar Orphan collections - a strategy for the future is being organised in conjunction with the MA conference. The date and duration of this meeting have yet to be finalised.

A more concerted effort is being made to raise the profile of the Group, both within the museum and geological communities and to the public at large. Meetings schedules are now being distributed to a greater number of organisations, including Palaeontological and Mineralogical Societies. 30,000 of the new GCG leaflets have been produced, to be distributed not only through the membership but also in

publications such as *Geoscientist* (7500 copies), *Museums Journal* (5000 copies) and the new *Earth Heritage* magazine (1000 copies).

GCG currently lacks any displays for events such as the GA Reunion. However display panels based on the new leaflet's graphics are now being created by John Cooper at Brighton. The 'Thumbs-up' leaflet, now virtually out of circulation, is being updated prior to a re-print in 1994.

Thanks particularly to those who suggested potential topics for future meetings and specific improvements to the GCG meetings programme. These are all being considered and will help in the planning of future meetings.

6. Secretary's Report from Simon Knell

The Group continues to pursue new and exciting initiatives, most notably the Chairman's proposal for an MGC report on the use of natural science collections.

Two other initiatives, developed over this last year, have been in the areas of terminology and uncurated collections. The latter subject has, of course, been a major area of concern in the past but in recent years it has slipped from the Group's main agenda. Simon Timberlake is now in the process of putting together a working party which will examine the whole issue of collections without specialist care particularly in the light of the demise of peripatetic curatorial services. This working party will make recommendations on initiatives which might be taken, or promoted, by GCG. I am sure Simon would welcome the involvement of members from outside of the Committee.

A terminology working party has also been established consisting of Roy Clements, John Cooper, Monica Price, John Faithfull and John Nudds. The party will examine and make recommendations on those categories of data which are currently recorded using a variety of non-standardised vocabularies. Hopefully, some progress will be made on developing word lists where appropriate and providing information on appropriate classifications.

The Group was well represented on the Expert Panel which considered the MGC's *Standards for the Museum Care of Geological Collections*, a publication which it is hoped will form the standard against which levels of collections care will be measured. It is certain to be updated and modified in the future and the Committee would welcome members' thoughts on improvements to the content.

Since the Group has promoted considerable interest in the history of geology museums it seems appropriate that it should itself look at properly archiving materials generated in the course of its business. I am delighted that Sue Rainton has volunteered to take on the role of Group Archivist, and I know Sue would welcome any material currently held by 'old' committee members/officers. The archiving policy was published in the last edition of *Coprolite*.

The Committee has also examined its own make up, and has sought new blood. An appeal for nominations for committee membership failed to generate any for this AGM, and whilst it is recognised that it can be difficult to get funds for travel to meetings, such a situation cannot be good for any democratic organisation. The Committee welcomes nominations/volunteers for any of the officer or committee posts at any time.

Finally, 1994 will see the 20th Anniversary of the Group and a meeting to celebrate this occasion will be held in Northampton on May 17th. This meeting will include an examination of the Group's past achievements and failures, and look to its future. There will be an anniversary dinner in the evening and a field day on the 18th. Come along and make this a real celebration.

I cannot end this report without thanking two people in particular for their support this year. Paul Ensom, as incoming Chairman, has done an exceptional job in taking up the reins and developing new initiatives, but equally importantly he has taken on much of the work of the Secretary at times when I have been swamped by other commitments. Also, Colin Reid, who has coped superbly with the meetings programme and publicity in what has at times been a difficult year, and I am sure the Group will see improved fortunes with the seminar programme and publicity in Colin's hands. The Group's publicity efforts will also be greatly improved with John Cooper and Nigel Cunningham's exceptional leaflet (we have already been approached by one national organisation interested in emulating it!).

7. Treasurer's Report from Andrew Newman

In the absence of Andy Newman the report was presented by Paul Ensom.

Finance

The accounts for the period 3/12/92 - 8/12/93 are attached. The Geological Curators' Group has total assets of £15,502.49. I am generally pleased with the overall financial position. However income has been reduced, mainly through late payment of subscriptions and a reduction in the interest rate. It has not yet been possible to circulate members who have not paid but this will be done in the near future. The Group, once again, must express thanks to CJC Burhouse for their generous sponsorship of *Coprolite*. Expenditure has been reduced by problems over the production of *The Geological Curator*. The new publicity/membership leaflet has been the main expense of the year. However, I feel that this is an important investment in the Group's future. I am pleased to note that committee expenses have been kept down.

Membership

The total membership comprises of:

UK personal members	256
Overseas personal	53
UK institutions	99
Overseas institutions	58

Total subscriptions of 466. This represents an increase of 8 over 1992. It is planned to circulate the new membership leaflet as widely as possible.

I would like to thank P. S. Davis and K. Sedman for their annual audit.

8. Editor's Report from Peter Crowther

In the absence of Peter Crowther the report was presented by Paul Ensom.

No issues of *The Geological Curator* have been published in 1993, for which dismal record I offer the Group my apologies. Without boring you with the details, a major factor has been the intolerable working environment suffered by Bristol curators during a prolonged period of staff restructuring. Even now we face several more months of uncertainty and little prospect of any very positive outcome. Under these circumstances and, more importantly, because I have failed to deliver anything for far too long, whatever mitigating factors I care to claim, it is time for me to hand on the editor's red pen! I have enjoyed most of my eight years as the Group's editor, and I wish my successor the best of luck.

Mock-ups of Vol.5, Nos. 8 and 9 are available today, as some proof that publication is not far away. Other issues are in hand: one will include papers on specimen conservation and preparation by Arthur Cruickshank (A Victorian fossil wholemount technique - a cautionary tale for our times), Caroline Buttler (Conservation of the Sedgwick Museum's Quaternary *Hippopotamus* skeleton), Jane Clarke (Authigenic minerals in vertebrate fossils from the Wealden Group of the Isle of Wight), and Richard Twitchett (Preparation of the A303 *Ophthalmosaurus*); another will carry papers given at the 1992 AGM, including those by Gordon Chancellor (Pliosaurs, mammoths and volunteers) and David Sole (The role of the professional collector).

Other articles which should also appear in 1994 include those by Roy Clements and John Faithfull (A keyword system for the classification and description of geological objects) and Simon Kelly (A Boreal perisphinctid ammonite in Australia a case of nineteenth century transportation?).

- The Editor stands down at this meeting and the Chairman proposed a vote of thanks to Peter for his many years of service in the post, and for the high quality product he had produced.

9. Recorder's Report from John Nudds

The Directory of British Geological Museums

Final text is now with our designer in Brighton who is planning page lay-out to conform with the Geologists' Directory. The text should go to the Geological Society Publishing House in Bath immediately after Christmas and we are planning publication to coincide with the Group's 20th anniversary meeting at Northampton in May, 1994. All illustrations will be returned to compilers as soon as possible.

- It was pointed out, by David Bertie, that Scottish Museums will not be asked to audit their collections. This is an official view taken by both the Scottish Museums Council and the Scottish Federation of Museums and Galleries.

International Conference on the Value and Valuation of Natural Science Collections

With the imminent publication of the Directory, my role as Recorder for the next session will be as the GCG's representative on the organising committee for this international conference being organised by the Geological Curators' Group, the Biology Curators' Group and The Manchester Museum. The conference will be held at Manchester University on the 19th-21st April 1995 and aims to promote discussion on the value to society of natural science collections and the way in which these social and scientific values may also be expressed in financial terms.

The subject is timely because curators are now being asked to put commercial and insurance valuations on museum collections for audit purposes. It is also becoming increasingly important to be able to justify the use of resources to maintain and curate natural science material. The international line-up of speakers will be drawn from government agencies, users of collections, museums, insurers, dealers and auction houses. The conference will be of interest to curators, directors and trustees of museums, government and local authority agencies and auditors.

10. National Scheme for Geological Site Documentation Coordinator's Report from Mick Stanley.

No formal report was given. The Chairman noted the following on behalf of Mick Stanley.

- There has been no comment from B.G.S. on the progress of data input for the National Site Record.
- Charlie Copp is currently working on GD2; information is being received from RIGS groups.
- John Aram, from Rockwatch has circulated Rockwatch packs which is seen as a very encouraging move.
- Mick Stanley has expressed a wish to step down from this post in the near future and would like to hear from members who are interested taking on his role.

11. Election of Officers and committee

Nominations had been received for the following positions on committee:

Secretary - Simon Knell stands down at this meeting. Mandy Edwards was nominated for the post: proposed by John Nudds; seconded by Monica Price. There were no other nominations for the post and Mandy was declared elected.
Editor - Peter Crowther stands down at this meeting. Patrick Wyse Jackson was nominated for the post: proposed by Phil Doughty; seconded by Kenneth James. There were no other nominations for the post and Patrick was declared elected.

Public Relations Officer - Colin Reid was proposed by Paul Ensom: seconded by Simon Knell. There being no other

nominations Colin was declared elected.

Committee Posts - four committee posts fall vacant at this meeting. Nominations for the vacant posts were: John Faithfull - proposed by Graham Durant, seconded by Bob Reekie; Simon Timberlake - proposed by Ann Abernethy, seconded by Mark Simmons; Gill Weightman - proposed by John Faithfull, seconded by Simon Timberlake. There being no other nominations the above members of committee were declared elected.

Committee will nominate a candidate to fill the other vacant committee post for the coming year.

Co-options to the committee will be made by committee in January 1994.

12. Election of Auditors

The re-election of Ken Sedman and Peter Davies as auditors was proposed by Monica Price, seconded by John Nudds and approved.

13. Any other business

a. The Chairman told the meeting that the M.A. were expecting large cuts to their grant in the next two years (25% in 1994/95 and 50% in 1995/96). He had written to M.G.C. on behalf of the group. M.G.C. meet on 10th December to discuss the

future of M.D.A.

b. B.G.S. are closing two of their regional offices. They aim to save £120,000 per year and plan to disperse regional staff back to Keyworth and Edinburgh. The proposed closure date is September 1994. The Chairman was writing to Dr Peter Cooke B.G.S. Director, on behalf of the Group.

c. Bath Royal Literature and Philosophical Institution has had new trustees appointed and the situation is now looking most encouraging.

14. Date and venue of next AGM

30th November 1994 at the National Museum of Wales, Cardiff.

The Chairman paid tribute to Simon Knell who, as Secretary, had served the Group with great loyalty and enthusiasm, over 5 years.

Paul Ensom proposed a vote of thanks to the hosts John Faithfull, Graham Durant and Professor McCleod, for their hospitality and the organisation of an excellent meeting in such a superb setting.

Annual Accounts 1993 (3 December 1992 - 8 December 1993)

	1993	1992		1993	1992
Current Account Income			Current Account Expenditure		
Subscriptions	2058.00	3409.00	<i>Geological Curator</i>		
Sale of backnumbers	248.00	35.00	Printing	-	610.34
Advertisements/Sponsorship	500.00	500.00	Postage	-	518.54
Meetings fees	151.00	-	Sundries	-	14.24
Transfer	-	1200.00	Typing	-	58.00
Expenses refund	-	102.00	<i>Meetings</i>		
Refund bank charge	4.60	-	Committee	131.85	428.30
Sec. Exp. not cashed	50.00	-	J. Morrell	-	10.55
MA refund	35.00	-	MA	-	35.00
Balance	<u>1268.72</u>	<u>272.67</u>	General	209.50	-
	<u>£4315.82</u>	<u>£5518.67</u>	<i>Coprolite</i>		
			Print and distribute	892.83	1095.73
			<i>Brighton Medal</i>		
			Tower Mint	-	1339.50
			Design	-	37.00
			Engrave	11.00	-
			<i>Other expenditure</i>		
			Postage	17.46	30.97
			Secretarial expenses	-	50.00
			Computer Labels	-	21.78
			MGC	12.00	-
			Univ. South	114.00	-
			<i>Publicity Leaflet</i>		
			Slide	17.50	-
			Photo	35.00	-
			Design	213.22	-
			Print	1544.00	-
			Post	22.78	-
			<i>Trans.</i>	116.00	-
			Balance	1258.72	272.67
				<u>£4315.82</u>	<u>£5518.67</u>
Premier Interest Account Income			Premier Interest Account Expenditure		
Interest	705.81	1130.16	Transfer to current account	-	1200.00
Transfer	116.00	-	Balance	14523.81	13702.06
Balance	<u>13702.00</u>	<u>13771.90</u>		<u>£14523.81</u>	<u>£14902.06</u>
	<u>£14523.81</u>	<u>£14902.06</u>			
A.G. Brighton Funds in Premier Interest Account					
Income (interest)	77.00				
Balance	<u>1490.23</u>				
	<u>1567.23</u>				
Expenditure					
DAW (Scunthorpe)	90.50				
Engraving	11.00				
	<u>101.50</u>				
Total AGB Funds	<u>1465.73</u>		Total Income	3752.91	6366.16
			Total Expenditure	3337.14	4249.95
				<u>£415.77</u>	<u>£3598.37</u>

[signed] A. Newman *GCG Treasurer*

[signed] P.S. Davis and K. Sedman *Auditors*

THE GEOLOGICAL CURATOR

Publication scheme

Two issues of *The Geological Curator* are published for each year (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 typed on good quality paper (A4 size) double spaced, with wide margins, and if possible on disk (preferably formatted for a Macintosh in Microsoft Word or MacWriteII, although other disk types will be accepted - please quote system type and wordprocessing package used). Three copies should be sent to the Editor, Patrick N. Wyse Jackson, Department of Geology, Trinity College, Dublin 2, Ireland (tel 01 6081477; fax 01 6711199; e-mail: wysjcknp@tcd.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. Fifty reprints are supplied at cost. Major articles are refereed. Copyright is retained by authors.

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