

# GEOLOGICAL CURATOR



---

Volume 6

Number 7

---



## GEOLOGICAL CURATORS' GROUP

Registered Charity No. 296050

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

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

### 1997 COMMITTEE

Chairman	John R. Nudds, The Manchester Museum, University of Manchester, Oxford Road, Manchester M13 9PL (tel. 161 275 2634; fax. 161 275 2676; e-mail: john.nudds@man.ac.uk)
Secretary	Mandy Edwards, Department of Geology, University of Manchester, Manchester M13 9PL (tel. 161 2753825; fax. 161 2753947; e-mail: aedwards@fs2.ge.man.ac.uk)
Treasurer/Membership Secretary	Andrew Newman, Department of Archaeology, University of Newcastle, Newcastle-upon-Tyne NE2 4PT (tel. 191 2227419; fax. 191 2611182; e-mail: andrew.newman@ncl.ac.uk)
Programme Secretary	Steve McLean, The Hancock Museum, The University, Newcastle-upon-Tyne NE2 4PT, U.K. (tel. 191 2227418; fax. 191 2226753; e-mail: s.g.mclean@newcastle.ac.uk)
Editor of <i>The Geological Curator</i>	Patrick N. Wyse Jackson, Department of Geology, Trinity College, Dublin 2, Ireland (tel. 01 6081477; fax. 01 6711199; e-mail: wysjcknp@tcd.ie)
Editor of <i>Coprolite</i>	Tom Sharpe, Department of Geology, National Museum of Wales, Cathays Park, Cardiff CF1 3NP, Wales, U.K. (tel. 1222 397951)
Recorder	John Faithfull, Hunterian Museum, University of Glasgow, Glasgow G12 8QQ (tel. 141 3398855; fax. 141 3078059; e-mail: j.faithfull@museum.gla.ac.uk)
Minutes Secretary	John Crossling, Warwickshire Museum, Market Place, Warwick CV34 4SA, U.K. (tel. 1926 412481; fax. 1926 419840).
Committee	Colin Reid, Dudley Museum and Art Gallery, St James' Road, Dudley, West Midlands DY1, U.K. (tel. 141 3398855; fax. 141 3078059) Wendy Simkiss, Department of Geology, National Museums and Galleries on Merseyside, William Brown Street, Liverpool L3 8EN, U.K. (tel. 151 4784212; fax. 151 4784390) Alistair Bowden, Clitheroe Castle Museum, Clitheroe, Lancashire BB7 1BA, U.K. (tel./fax. 1200 24635) Glenys Wass, 2 Northfield, Great Bardfield, Braintree, Essex CM7 4TF, U.K. (tel. 1371 810498; e-mail: g.wass@nhm.ac.uk)
Co-opted	Steve Thompson, (BCG), Keeper of Natural History, Scunthorpe Museum and Art Gallery, Oswald Road, Scunthorpe, South Humberside DN15 7BD (tel. 1724 843533; fax. 1724 270474)

The views expressed by authors in *The Geological Curator* are entirely their own and do not represent those of either the Geological Curators' Group or the Geological Society of London unless otherwise stated.

© The Geological Curators' Group. ISSN 0144 - 5294

---

Cover: Visitors at *The Evolution of Wales* exhibition, National Museum of Wales, Cardiff. See article by D. Johnston and T. Sharpe, p. 255-266.

# THE GEOLOGICAL CURATOR

VOLUME 6, No.7

## CONTENTS

### PAPERS

G.B. ALEXANDER'S STUDIES ON THE JURASSIC OF GIBRALTAR AND THE CARBONIFEROUS OF ENGLAND: THE END OF A MYSTERY? by E.P.F. Rose and J.A. Cooper .....	.247
VISITOR BEHAVIOUR AT <i>THE EVOLUTION OF WALES</i> EXHIBITION, NATIONAL MUSEUM AND GALLERY, CARDIFF, WALES. by D. Johnston and T. Sharpe .....	.255
MUSEUMS & GALLERIES COMMISSION STANDARDS IN THE CARE OF MUSEUMS COLLECTIONS: WHAT ARE THE IMPLICATIONS? by C. Paine .....	.267
THE BCG/GCG ORPHAN COLLECTIONS WORKING PARTY REPORT: PREAMBLE. by S. Thompson .....	.269
THE BCG/GCG ORPHAN COLLECTIONS WORKING PARTY REPORT. by C. Collins, J.A. Cooper, R. Roden, M. Simmons, S. Timberlake and S. Thompson; edited by S. Thompson ...	.271
LOST AND FOUND.....	.275
BOOK REVIEWS .....	.277
GEOLOGICAL CURATORS' GROUP - 22ND ANNUAL GENERAL MEETING .....	.281
AWARD OF THE BRIGHTON MEDAL TO BOB KING - CITATION AND REPLY .....	.287

# G. B. ALEXANDER'S STUDIES ON THE JURASSIC OF GIBRALTAR AND THE CARBONIFEROUS OF ENGLAND: THE END OF A MYSTERY?

by Edward P. F. Rose and John A. Cooper



Rose, E.P.F. & Cooper, J.A. 1997. G.B. Alexander's studies on the Jurassic of Gibraltar and the Carboniferous of England: the end of a mystery? *The Geological Curator* 6(7): 247 - 254.

George Baker Alexander (1907-1980), a graduate of St. John's College, Cambridge, began research on the Carboniferous Limestone biostratigraphy of Staffordshire, Derbyshire, and West Yorkshire whilst based at the University of Leeds in 1930-1932 and Imperial College London in 1933-1934. He disappeared before the work was completed, for reasons unknown, but a collection of over 1,100 specimens, mostly corals, brachiopods, and goniatites, was donated to the Booth Museum of Natural History following his death in Brighton in September 1980. Other material of his is preserved at the Sedgwick Museum, Cambridge; the British Geological Survey, Keyworth; and the Natural History Museum, London. Between 1945 and 1948 he served as a Royal Engineer officer on Gibraltar, preparing a draft 1:2,500 scale geological map, many unpublished diagrams, and a few brief geotechnical reports relating to the Rock, dominantly a Lower Jurassic dolomitic limestone but very similar in gross appearance to that of the English Lower Carboniferous. He again disappeared, before his expected *magnum opus* was completed. Rock specimens and some documents left at the Natural History Museum, London, were transferred in 1967 to the Gibraltar Museum; a few additional documents were donated to the Booth Museum by Alexander's sister in 1980; other specimens and documents relating to his Gibraltar work cannot now be traced and may have been lost or destroyed.

*Edward P.F. Rose, Department of Geology, Royal Holloway, University of London, Egham, Surrey TW20 0EX, U.K.; John A. Cooper, The Booth Museum of Natural History, 194 Dyke Road, Brighton, BN1 5AA, U.K. Received 7th October 1996; revised version received 10th January 1997.*

## Introduction

George Baker Alexander (Figure 1), a geology graduate of St John's College, Cambridge, served as a Royal Engineer officer on Gibraltar from March 1945 to February 1948. His unpublished geological achievements included an entirely new geological map of the 6 km<sup>2</sup> peninsula at 1:2,500 scale which distinguished 19 stratigraphic divisions within the largely Liassic bedrock sequence, and seven categories of superficial deposits; 33 west-east cross-sections which together illustrated the geological structure of the Rock down to sea level throughout its 5 km length; diagrams which illustrated the relationship of Gibraltar to the geology of adjacent areas of southern Spain, and the sequence of raised beaches on Gibraltar; plus several geotechnical reports which interpreted aspects of the geology for specific military or construction projects (Rose & Rosenbaum 1989b). They also included the first excavations at Gorham's Cave (Finlayson 1994), now recognised to be an archaeological site of major significance whose sedimentary infill contains evidence of successive occupancy from neanderthal to

anatomically-modern humans up to historical times (Waechter 1951, 1964; Rodriguez Vidal *et al.* 1994; Cooper 1996). Copies of his map and diagrams still circulate on Gibraltar, influencing construction work to the present day.

Yet as already noted in *The Geological Curator* (Devenish 1994; Rose 1994), soon after his return to England Alexander seemingly 'disappeared under mysterious circumstances' leaving his Gibraltar studies incomplete - and his collections uncatalogued, whereabouts uncertain. Rose & Rosenbaum (1989b, 1992) have given an account of the disappearance, based on military records and on archive correspondence at the British Geological Survey, Keyworth, and the Natural History Museum, London. We here report some details of Alexander's earlier work on the Carboniferous Limestone of north-east England that may have stimulated his interest in the superficially very similar (but Jurassic) Gibraltar Limestone; his death in Brighton in September 1980; the significance of some manuscript material relevant to Gibraltar deposited in the Booth Museum as a consequence of it; and the current location of at least some of his collections.

## Pre-Gibraltar: 1907-1945

According to records at St John's College, Cambridge, Alexander was born on 25 September 1907 at 96 Sackville Street, Barnsley, County York. (The date is consistent with Register Office records at Barnsley Town Hall, registry records at Imperial College London, and army records, although 26 August 1907 is mistakenly given as the date of birth on his death certificate). His father was George Glover Alexander, a graduate of Downing College, Cambridge (BA 1887, MA 1901, LLM 1905) Barrister-at-Law and by 1926 Deputy Recorder for Leeds. His mother was Mary-Ann Goldthorpe Baker.

Alexander attended Holgate Grammar School for Barnsley District from September 1916 to July 1923, and the Grammar School, Leeds, from September 1923 to July 1926. He entered St John's College on 21 September 1926, under the tutorship of (Sir) J.M. Wordie, a noted Antarctic explorer and English petrologist who later became master of the College. At this time Alexander's parental home was recorded as Ridgefield, North Hill Road, Headingley, Leeds. He took Natural Sciences Tripos Part I in 1928, gaining second class honours; was awarded a BA degree in 1929; and passed Natural Sciences Tripos Part II, Geology, in 1930, with third class honours. He did not subsequently proceed to an MA degree.

On leaving Cambridge in 1930, Alexander was appointed Record Assistant and Demonstrator in the Department of Geology, University of Leeds (H.C. Versey, pers. comm.). He held this post for only two years, there being no security of tenure, and was responsible for fieldwork teaching, with special emphasis on the Carboniferous Limestone of West Yorkshire. During this time he took an active role as a member of the Leeds Geological Association. There are records of two lectures given by him in 1932 (Anon. 1934, p. 35), on 5 May 'Theories of evolution' and on 8 December 'An example in the use of statistical methods in the study of evolution'. A paper describing the results of some of his fieldwork appeared in the Association's Transactions (Alexander 1934).

His collections (see below) of Carboniferous corals, brachiopods, and goniatites, together with many field slips, now in the Booth Museum of Natural History at Brighton, clearly date from this time. His main research seems to have been in the north Staffordshire/south-west Derbyshire area, near Dovedale, where he worked on pre-*Dibunophyllum* biostratigraphy. There are memories of his use of explosives to blast out material from the top of the Thorpe Cloud reef as early as 1933 (Murray Mitchell, pers. comm. 1984). In attempting to document this period, it was gathered by one of us (J.A.C.) that a number of boxes containing his fossils



Figure 1. George Baker Alexander (1907-1980), from the Sedgwick Club, Cambridge, photograph for 1929 (courtesy of the Woodwardian Professor of Geology).

remained in the Department of Geology at Leeds until the 1940s, but that none were to be found there now. Staff speculated that this material was either discarded or merged with the teaching collections. The boxes may well have contained the material referred to in a covering letter by J. Selwyn Turner, a geology lecturer at Leeds, when in March 1961 he returned to the Sedgwick Museum at Cambridge some specimens borrowed by Alexander in May 1932 (mostly *Glyphioceras* spp. from Settle). In the letter, to A.G. Brighton, Selwyn Turner states that his staff were 'turning out a mass of material belonging to a fellow named G.B. Alexander who was once here *and disappeared completely* into outer space during the war and has never been heard of since' (our italics). Apparently the specimens arrived back with the comment that Alexander was 'a queer fish and capable of any eccentricity'.

Many of the specimens borrowed by Alexander were never found. It is unlikely that any of the material 'turned out' included the collections that ultimately came to Brighton, unless they were returned to his mother - since the university clearly had no forwarding address for Alexander himself. Some of the material may be that now curated by the British Geological

Survey, received via its Leeds office, as recorded below.

After Leeds, Alexander moved to London. Records at Imperial College indicate that he registered there for postgraduate research from 7 March 1933, with the proposed thesis title 'Zonal Succession of Carboniferous Limestone of Derbyshire', under the supervision of Professor P.G.H. Boswell. The College forwarded an application for PhD registration to the University of London on 9 March, and approval was given on 22 May. Progress reports were sent to the University on 28 June 1933, and 29 June 1934. However, on 9 October 1934 it was recorded that 'University state that as student has not taken steps to register for PhD he must in accordance with regulations lose courses attended'. On 11 October the 'University [was] notified that student has not resumed attendance.' Imperial formally terminated his membership of the College in June 1935, noting that 'Professor Boswell reports student as unsatisfactory'.

The Natural History Museum, London, had records that a Carboniferous goniatite was loaned to Alexander in 1935 - and that efforts were made to trace him to reclaim it (R.J. Cleavelly, pers. comm. 1989). In April 1935 he presented seven thin sections (M921-7, see appendix) to (Sir) James Subbelfield at the British Geological Survey, with a covering letter written from 6, Mason Place, Queen's Gate, London SW7. Professor Boswell, in a letter dated 10 May 1938, reported that Alexander 'left Imperial about 1936', and he seems to have quickly disappeared from the London geological scene. He never became a Fellow of the Geological Society.

His precise movements over the next few years are uncertain. He continued his membership of the Leeds Geological Association until at least 1946, when his address was recorded as Goldsborough near Harrogate - apparently then the family home, since the Booth Museum collections contain an envelope dated February 1939 addressed to Mrs. Alexander (his mother) at that address. He himself led a field meeting for the Yorkshire Geological Society on 29-30 May 1939 in the Buxton area of Derbyshire and published a brief report (Alexander 1940). Soon after commissioning in the army in 1943, however, he met a fellow enthusiastic collector (of insects) (Peter Taylor, pers. comm. 1995) in woods near Ruislip, and claimed to have been in South America prospecting for minerals, before working his passage back to Southampton. At that time, Alexander was described as a man with a strong sense of social injustice and a well-developed sense of humour who had 'lived in hotels with his mother' and who travelled in the family Daimler.

According to Army records, Alexander enlisted in the Territorial Army (War Emergency Royal Artillery) on 7 May 1942, at Nostell Priory - a former stately home about 8 km south-east of Wakefield, then in the West Riding of Yorkshire. He was immediately posted as a gunner to 39 Signal Training Regiment RA at Wakefield, and on 4 December to 3 Medium Reserve Regiment RA at Watford. On 20 August 1943 he was posted to 140 Officer Cadet Training Unit Royal Engineers at Newark, as a cadet, and on 8 October granted an Emergency Commission as a Second Lieutenant, Royal Engineers (*The London Gazette*, 24 November 1944). Posted to 2 Line of Communication (L of C) Troops Engineers in London on 15 October, he was allocated to serve in the United Kingdom, on temporary attachment to 9 Boring Platoon RE from 16 October, and DCRE East Gloucester from 16 November. On 29 December 2 L of C Troops Engineers was converted to 402 L of C Troops Engineers. On 8 March 1945 Alexander embarked for Gibraltar.

Alexander disembarked at Gibraltar on 16 March 1945, and was posted to the Chief Engineer's pool. He was appointed a Staff Officer RE III and promoted to War Substantive Lieutenant (Acting Captain) on 1 February 1946. On 1 July he was posted to Headquarters Royal Engineers Gibraltar Garrison as a Lieutenant (Temporary Captain), being granted leave in the UK from 18 July to 20 September. He finally disembarked in the UK from Gibraltar on 3 February 1948 and was released from the army on 6 May 1948. Although his commission was not formally relinquished until 15 March 1954 (*The London Gazette*, 16 April 1954), all military correspondence ceased in 1948. He had achieved award of the War Medal 1939-45, the Defence Medal, and finally the honorary rank of Captain.

### **Gibraltar: 1945-1948**

Correspondence archives at the Natural History Museum, London, have provided evidence that although Alexander arrived on Gibraltar without even a hand lens (letter of 6 June 1945 to Dr W.N. Edwards) he had soon extracted some fragmentary fossils: 3 brachiopods (2 now in the collections of the Natural History Museum) (Owen & Rose, in press), 1 solitary coral, 15 specimens of 'algae' (Bryozoa or stromatoporoids ?), and 2 gastropods. Sent for identification, there is no record of the Museum's reply. It seems that Alexander was by then already known to the Museum, since the copy of an undated letter to Dr Edwards [Keeper of Geology, BM(NH) 1938-1955, and pre-war a contributor to the Leeds Geological Association contemporary with Alexander] is preserved with his British specimens now in the Booth Museum. It declares that 'the war has upset my plans, like most peoples', and I don't see

much chance of doing anything with a good deal of my stuff, so it seems to me best to send my slides and notes to you altogether'. The 'stuff' was presumably his Carboniferous material, but none of this is conserved in the Department of Palaeontology (see below), so is presumably the material finally given to the Booth Museum.

In British Geological Survey files at Keyworth, there are copies of letters sent by the Director, (Sir) E.B. Bailey, from the Edinburgh office of the Survey to the then chief palaeontologist, Dr C.P. Chatwin, in London. It is clear that Alexander visited Chatwin during his leave in the United Kingdom during the summer of 1946, and the visit was reported to Bailey. At that time Bailey and Chatwin had already prepared the draft of an account of Gibraltar geology, based on visits by Bailey to Gibraltar in 1943, and specimens later sent to him by A.L. Greig (Rose & Rosenbaum 1989a, 1992). The early letters following the visit are euphoric: there is 'hope it will lead to profitable collaboration' (27 August 1946); request to the War Office to 'send Alexander here for official discussion' (3 September 1946); report that 'Alexander and I have had a very good talk over Gibraltar' (6 September 1946); pleasure that 'we are in luck to have a good man like Alexander on the spot' (18 September 1946). Then doubt sets in: 'I have had a long letter from Alexander... At the moment I have not gathered a very clear idea of what he is getting at' (18 November 1946). Then despair: 'That amazing Alexander has *completely disappeared*' (1 October 1947) (our italics). But then he reappeared: 'I have been South and had two day's talk with Alexander... I naturally want to help Alexander as much as possible' (23 March 1948). Finally, there was again despair: 'It's no use waiting for the disappearing Alexander' (16 December 1949). Bailey therefore abandoned his initial plans for a paper on Gibraltar to be written in collaboration with Alexander, and published an account as sole author (Bailey 1952). There was due acknowledgement to Chatwin and to Greig, and to assistance from Natural History Museum palaeontologists L.F. Spath and H.M. Muir Wood - but no mention of Alexander.

From the 27 August 1946 letter it is clear that a typed draft of a paper by Bailey and Chatwin had already been prepared, whereas Alexander had brought with him only 'two pencil pages on Gibraltar'. The plan agreed by Bailey with Alexander and notified to Chatwin on 6 September was '(1) You and I postpone our paper. (2) Alexander will take a copy to Gib[raltar] with him. (3) He will specially concentrate on (a) fossils in the limestone & any local evidence as to whether the limestone is upside down or no, (b) the possibility of there being an upper as well as a lower shale group.....

(c) related to (b) the possibility of clinching or upsetting the correlation of the radiolarian chert of the town outcrop with that of the other outcrops. (4) He will arrange with the B[ritish] M[useum] [(Natural History)] to get you to deal with his fossils to the extent required for our paper. (5) He will present his lithological material to the Survey foreign collection & ask them to send the specimens and slices for me to look through in his absence. (6) If after checking on the ground, he blesses our paper as a sound suggestion he will come in as a joint author & rewrite such bits as need retouching - quite a lot I have no doubt. I forgot to say that Alexander will be able to visit Algeciras and probably Musa. (7) If after checking he gives good reason to believe we are wrong we can withdraw gracefully.'

However, it seems that Alexander did not adhere precisely to the plan. The letters refer to some of his Gibraltar fossils, but apart from two brachiopods, none of them are catalogued in Natural History Museum or Survey collections. There is no record that he presented Gibraltar lithological material to the Survey. Records seen at the Natural History Museum indicate that Alexander worked there on his own material following his return to the United Kingdom in February 1948, but that his visits stopped abruptly in April.

Correspondence seen on Gibraltar in the archives of 1st (Fortress) Specialist Team Royal Engineers, before it was disbanded in 1995, indicated that Alexander had been preparing a memoir on the geology of Gibraltar, but left the Rock before completing it. Letters were sent to England on behalf of the Governor trying to trace Alexander and obtain the 'promised' report; but Scotland Yard and M15 were unable to locate him! (R.J. Cleevely, pers. comm. 1989). Letters seen at the Natural History Museum speculate that he might have been taken ill or might have joined the petroleum industry abroad, but the reasons for his sudden and total disappearance from the British geological scene became a mystery.

In 1949 Bailey 'rescued from among his litter' [at the Natural History Museum] the copy of the Bailey/Chatwin manuscript given to Alexander in 1946 - a draft probably destroyed when superseded by the version published by Bailey in 1952. In July 1958 the Chief Engineer of the Gibraltar Garrison agreed to the Museum's suggestion of 17 June that his 'office would be an excellent place to house the notes and maps' left behind by Alexander, and these were duly returned to the Rock. Maps, diagrams and some reports were located there until recently at Headquarters British Forces - but no 'notes'. On 29 August 1967 a number of items in his collection were transferred to the trusteeship of the Gibraltar Museum from the Natural History Museum in London, the Natural History

Museum having 'for at least the last 10 years been hoping and endeavouring to contact Captain Alexander, but without success.'

D.C. Devenish, curator of the Gibraltar Museum at that time, reported (1994, p. 32) that 'in about 1968' (= 1967) he examined a small store room at the Natural History Museum filled with archaeological and geological specimens from Gibraltar, and arranged for the archaeological items (mainly Phoenician pottery) to be sent to the Gibraltar Museum, but the number of rock specimens was so excessive (a few hundredweight at least) that he could only make a small selection. This part of Alexander's rock collection is now preserved in the Gibraltar Museum, but there is no record of any of the rare fossils from the bedrock mentioned in Survey correspondence. There is no record at the Natural History Museum of any remaining rock specimens - or indeed now of the 'small store room'.

### Post-Gibraltar: 1948-1980

In October 1980 a collection of specimens, slides and documents belonging to Alexander was donated to the Booth Museum by his sister, Miss Ellen Baker Alexander of Cookridge, Leeds, shortly after his death. More material was made available in November 1981. We can therefore report that Alexander died at Brighton on 8 September 1980 - from bronchopneumonia and senile dementia according to his death certificate. Miss Alexander notified the local authorities of her brother's death in Bevendean Hospital, Brighton, the day after the event and so was presumably visiting from her home in Yorkshire at the time.

We do not know exactly when Alexander arrived in Brighton. His address in 1958 was 2 Victoria Street, Brighton, according to a 'premium due' notice from an insurance company - the same address which appears on his death certificate, and the address from which his collections were moved to the Museum. His sister, however, referred to this address as his 'workshop', stating that it was in the same road as his flat in Montpelier Place, Brighton, re-let after his death. The Electoral Roll for 1954, for which the qualifying date was 20 November 1953, lists Alexander at Flat 3, 24 Montpelier Place, together with one George L. Bullard of whom nothing is known. A friend who had known Alexander since 1952 (W.J.G. Cowen, pers. comm. 1984, 1996) described him as a 'genial, if odd, man - although very intelligent and a real academic'. He recalled that Alexander had been 'involved with mining in Gibraltar', and that before the war he had been similarly involved in Canada.

Cowen described Alexander as having many interests, including magic, but especially in zoology and other branches of science, and that he had worked in the

University of Sussex 'with the animals'. We have been able to confirm that between April 1974 and August 1978 Alexander did indeed work as a part-time technician in the Animal Unit in the Department of Biological Sciences at the University. Moreover, he became a member of the Brighton and Hove Natural History Society, his first subscription being paid in October 1956 and his last in October 1964, when the society was fast becoming moribund - although there is no record that he made any verbal or written contribution to the society. He apparently devoted a lot of energy to making very sophisticated models, principally of sailing ships and skin diving rafts, and perhaps somewhat surprisingly this is confirmed by the occupation cited on his death certificate: 'Small Boat Builder (retired)'. After his death, abundant model-making materials were found in his 'workshop'.

Accompanying the Carboniferous specimens (see below) donated to the Booth Museum were some documents relating to Gibraltar:-

1. Pages numbered 36-37, 38, and 41-2 of a hand written manuscript describing Gibraltar-like strata seen by Alexander in Spain, near Grazalema and Guadalquivir.
2. Part (19 lines) of a hand written account of the Gibraltar Limestone, dealing only with the horizon he called 'The Barren Dolomite Beds'.
3. Copy of the log of an explanatory borehole near St George's Hall, by A.L. Greig (see Rose & Rosenbaum 1991, p 57).
4. An outline of the Pleistocene succession on Gibraltar - claiming 'an almost unrivalled series of raised beaches, corresponding exactly with that published by Zeuner in "Dating the Past" 1946 but with the addition of 2 older and higher beaches at approximately 210 and 260 metres, which must be Pliocene in age'.
5. Part of letter to Professor F.E. Zeuner (undated), mentioning that Alexander had 'been kept away from the Museum by private affairs which have dragged on from day to day unexpectedly', and discussing height measuring devices.
6. Letter dated 27 February 1948, giving the British Museum (Natural History) as a contact address, to an unknown correspondent, providing a summary of his interpretation of the solid geology, viz:-
  4. Upper Jurassic - siliceous clays
  3. Upper Lias - calcareous clays
  2. Lower Lias - limestone
  1. Keuper - sandy clays and thin limestone.

(all conformable, but non-sequences suspected between 2 and 3, and 3 and 4; overthrusts from east to west 'clearly marked by fossil horizons' *sic*)

7. Letter (undated) to Colonel Colville [Chief Engineer at Fortress HQ, Gibraltar], apologizing for communication delay, but reporting that 'it is clear that the "Dockyard Shales" are in fact of Tertiary age'

[and that a] 'great overthrust..... lies onshore below South Barracks'. 'I had a long conference on Thursday and Friday with Sir Edward Bailey and he has agreed that it will take several months to work out the material ....'

Sadly, it seems that the work was never completed. We do not know what became of the other pages of his manuscripts, or of most of the Gibraltar fossils he had collected or seen. His letter to Colonel Colville refers to three weeks work producing thin sections of rocks rich in microfossils, but no sectioned rocks have been returned to the Gibraltar Museum, and sections catalogued at the British Geological Survey seem to have been made there only from rock samples sent by A.L. Greig in 1943. Advertisement in *The Geological Curator* 5 (6) p. 231 has stimulated our co-operative effort here to document the geological re-appearance on death of Alexander in 1980, following his mysterious disappearance of 1948 - but there are years and specimens yet to be accounted for.

## Conclusion

Alexander's 1947 unpublished geological map was used to guide tunnelling and building works on Gibraltar until succeeded by a published map (Rosenbaum & Rose 1991) supported by a descriptive memoir (Rose & Rosenbaum 1991).

Many of the details as mapped by Alexander cannot now be verified on the ground; some significant features are no longer visible because of more recent quarrying or construction work, or landfill. Some of the rare Gibraltar fossils collected by Alexander or available to him (notably the ammonites collected by A.L. Greig) appear to have been lost, as well as part of his rock collection, and most pages of his draft memoir on the geology of Gibraltar. A file of correspondence and letter reports dating from at least 1943 to recent years which documented all military geological work on the Rock over that period, including aspects of work by Alexander, was kept by the Officer Commanding 1st (Fortress) Specialist Team Royal Engineers and his predecessors, but appears to have been lost or destroyed when the unit was disbanded in 1995. This paper is therefore written to provide a more permanent record of the documents and specimens generated by Alexander; to publish extracts from his seemingly final notes on Gibraltar stratigraphy and correlation; and to note his third and final 'complete' disappearance, through death in September 1980.

## Acknowledgements

For help to trace information about Alexander and/or his material we are grateful to I.N. McCave, Woodwardian Professor of Geology in the University of Cambridge, and

Fellow of St John's College; the Registrar, Imperial College, London; R.J. Cleevely, M.K. Howarth, J.C. Thackray and S.L. Long at the Natural History Museum, London; G. McKenna, Chief Librarian and Archivist, plus S.P. Tunnicliff and R.J. Merriman, British Geological Survey, Keyworth; D.C. Devenish, formerly Curator of the Gibraltar Museum, later of Wisbech and Fenland Museum; J.C. Finlayson, Director, Gibraltar Museum; the Ministry of Defence; the archivist and librarians at the Geological Society, London; Steven Laurie, museum technician, and Kate Andrew, former assistant, Sedgwick Museum, Cambridge; Murray Mitchell, formerly of the British Geological Survey; Professors H.C. Versey and J.C. Versey, both of the Department of Geological Sciences, University of Leeds; and Alexander's former associates Peter Taylor and W.J.G. Cowen. Searches by M. Gil, Gibraltar Department of Trade and Industry, Major Glyn Taylor RE, Defence Works Consultant Gibraltar, and present or former colleagues on Gibraltar have confirmed that correspondence files formerly seen there relating to Alexander seem not to have survived the break-up of the Gibraltar Government Public Works Department in 1988-89 and the withdrawal of the last Royal Engineer unit from the Rock in 1995.

## References

- ANON. 1934 (for 1932-3). Extracts from Annual Reports, 1932-1933. *Transactions of the Leeds Geological Association* 5 (2), 65-66.
- ALEXANDER, G.B. 1934 (for 1932-3). The Solenopora Zone in the Lower Carboniferous of the Midland Province. *Transactions of the Leeds Geological Association* 5 (2), 93-96.
- ALEXANDER, G.B. 1940. Monday, May 29th; Tuesday, May 30th. In: Field Meetings 1939. *Proceedings of the Yorkshire Geological Society* 24, 172-173.
- BAILEY, E.B. 1952. Notes on Gibraltar and the Northern Rif. *Quarterly Journal of the Geological Society of London* 108, 157-175.
- CLEEVELY, R.J. 1983. *World Palaeontological Collections*. British Museum (Natural History) & Mansell Publishing Limited, London. 365 p.
- COOPER, J.H. 1996. Quaternary micromammals from Gorham's Cave, Gibraltar, and their palaeoenvironmental significance. *Almoraima* 15, 69-85.
- DEVENISH, D.C. 1994. Lost and Found. 214. Jurassic ammonites from Gibraltar collected by Alan L. Greig (d. 1988). *The Geological Curator* 6, 32.
- FINLAYSON, [J.] C. 1994. History of the Gibraltar excavations. In: RODRIGUEZ VIDAL *et al.*, p. 2-5.
- OWEN, E.F. and ROSE, E.P.F. in press. Early Jurassic brachiopods from Gibraltar and their Tethyan affinities. *Palaeontology* 40(2).
- RODRIGUEZ VIDAL, J., DIAZ DEL OLMO, F., FINLAYSON, C. and GILES PACHECO, F. (eds) 1994. Gibraltar during the Quaternary. *AEQUA*

*Monografias*, Seville, 2, 1-150.

ROSE, E.P.F. 1994. Reply to Devenish. *The Geological Curator* 6, 32.

ROSE, E.P.F. and ROSENBAUM, M.S. 1989a. Royal Engineer geologists and the geology of Gibraltar. Part I - Tunnelling through the Rock. *The Royal Engineers Journal* 103, 142-151.

ROSE, E.P.F. and ROSENBAUM, M.S. 1989b. Royal Engineer geologists and the geology of Gibraltar. Part II - The age and geological history of the Rock. *The Royal Engineers Journal* 103, 248-259.

ROSE, E.P.F. and ROSENBAUM, M.S. 1991. *A Field Guide to the Geology of Gibraltar*. The Gibraltar Museum, Gibraltar. 192p.

ROSE, E.P.F. and ROSENBAUM, M.S. 1992. Geology of Gibraltar: School of Military Survey Miscellaneous Map 45 (published 1991) and its historical background. *The Royal Engineers Journal* 106, 168-173.

ROSENBAUM, M.S. and ROSE, E.P.F. 1991. Geology of Gibraltar. *School of Military Survey Miscellaneous Map 45*

WAECHTER, J. d'A. 1951. Excavations at Gorham's Cave, Gibraltar. *Proceedings of the Prehistorical Society* 17, 83-92.

WAECHTER, J. d'A. 1964. The excavation of Gorham's Cave, Gibraltar, 1951-54. *Bulletin of the Institute of Archaeology* 4, 189-221.

## **Appendix: Location of material pertaining to G.B. Alexander, as currently known**

### **Original documents**

1. St John's College, Cambridge: Record as undergraduate student.
2. Imperial College of Science, Technology and Medicine, London SW7 2BP: Record as PhD student.
3. Ministry of Defence: Record of service in the ranks (Army number 1147756) and as an officer (Personal number 312882).
4. Library Archives, The Natural History Museum, London SW7 5BD:  
(a) Correspondence file G.B. Alexander (contents specified and discussed by R.J. Cleevely in letter to E.P.F. Rose dated 20 February 1989);  
(b) Correspondence file Gibraltar Museum 1950-1984 (34 letters, those of relevance dated 1 July 1958 and 16 and 29 August 1967).
5. British Geological Survey, Keyworth,

Nottingham NG12 5GG: Correspondence file E.B. Bailey - Library Archives IGS 1/809 (nine relevant letters, dated 27 August 1946 to 3 January 1950).

6. Defence Works Services, Gibraltar: Royal Engineer drawings, as listed by Rose & Rosenbaum (1989b), previously in the possession of the Regional Works Office, Property Services Agency, Department of the Environment; Headquarters British Forces; or 1st (Fortress) Specialist Team Royal Engineers.
7. Booth Museum of Natural History, 194 Dyke Road, Brighton BN1 5AA.

### *For Gibraltar:*

Parts of 3 handwritten documents, 3 letters, and duplicate copy of A.L. Greig's 1943 borehole log.

### *For Britain:*

18 envelopes containing 6" Field slips many annotated, many with field boundaries marked and areas coloured, together with specimen locality numbers marked in red ink.

One box containing further field slips.

One envelope containing miscellaneous maps.

One box containing a variety of manuscripts, typescripts, sketches, notes etc viz.:

- Goniatite bands in reef limestones
- Notes on the stratigraphy of the Dovedale area
- Notes on the genus *Lithodactylon* [a new name to be proposed for an enigmatic Carboniferous Limestone fossil previously suspected to be an alga or a bryozoan]
- Envelope containing various confidential section logs through Carboniferous strata from the D'Arcy Exploration Co. Ltd.
- On a peculiar facies of the Carboniferous of the North of England and the Pacific affinities of its fauna
- Various notes on goniatites and corals
- The Calton Moor area of North Staffordshire (dated June 8th 1934)
- Copy of a letter from G.B.A. to Dr Edwards
- Bank Statement for G.B.A. dated 1953 from Barclays Bank, Knaresborough, Yorkshire
- Second notice for premium payment for policy of G.B.A. with The Employers' Liability Assurance Corporation Ltd., dated 17th June 1958

- Miscellaneous notes, sketches, sketch maps, cuttings from journals etc.

Two boxes of miscellaneous, non-geological cuttings.

Two index card files containing indices of goniatite and coral genera and species, and an author index.

Approximately 70 Ordnance Survey maps of varying scales and covering many parts of the country, but including many for Sussex.

## Specimens

1. Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar.

Trimmed rock specimens, part of a series numbered 1 to 64, many now without labels or other indication of source; sundry other rock specimens, and small boxes of Recent shells; a few 'Stone tools. Old stone age'.

2. Booth Museum of Natural History, 194 Dyke Road, Brighton BN1 5AA, U.K.

Geology Collections catalogue numbers: 014181 - 014680; 015359 - 015698; 016100 - 016378.  
- Over 1,100 specimens in all, mostly from the Carboniferous of Staffordshire, West Yorkshire and Derbyshire, and including corals, goniatites and brachiopods. Most of the specimens are well localised, some bearing red locality numbers, some of which match with the same numbers on Alexander's field slips (see above).

In addition to his geological collections, Alexander's entomological collections consisting of some 10 drawers of insects, mostly coleoptera, but including hymenoptera and hemiptera, are also preserved. The data with these insects reveal that Alexander was collecting in Yorkshire in the late 1920s, and that he continued to collect sporadically wherever he went. His later finds are all from Sussex and date from the early 1950s into the 1960s.

Thin sections: Geology Collections catalogue numbers: 015051 - 015358; 015699 - 015755.  
- Over 350 microscope thin sections, stored in 6 boxes, the vast majority being of Carboniferous corals, plus a few goniatites.

3. Sedgwick Museum, Downing Street, Cambridge CB2 3EQ, U.K.

Staff of the Sedgwick Museum, Cambridge, inform us that Alexander merits 153 catalogue entries for material collected and presented by him, and that these entries refer to some 528 specimens. The bulk of the material is Carboniferous Limestone, with some from the Kellaways Rock, South Cave, Yorkshire, and a few specimens collected from the Elsworth Rock and Corallian, presumably on University field trips since Alexander's college is specified on these records. A detailed listing of these specimens is currently unavailable.

4. Department of Palaeontology, The Natural History Museum, Cromwell Road, London SW7 5BD, U.K.

Cleevely (1983, p. 40) records that Alexander donated some Ammonoidea from the Kelways [sic] Rock, South Cave, Yorkshire in June 1933. Additional to these (*Sigaloceras* sp., numbered C36052-82), there are specimens of *Euaspidoceras* (C35974-5) from the Oxford Clay of Warboys, Cambridgeshire, donated in March 1933; also two brachiopods (BB11504-5) from the Jurassic of Gibraltar.

5. British Geological Survey, Keyworth, Nottingham NG12 5GG, U.K.

Palaeontological collections contain specimens (mostly goniatites) GSM54326-54394 from the Lower Carboniferous of Staffordshire and Derbyshire (presented February 1935); thin sections M921-7 of *Rylstonia benecompecta* from the Lower Carboniferous of Somerset, North Staffordshire, and West Derbyshire (presented April 1935); British Carboniferous goniatites GSM73142-4 (*Eumorphoceras*, from Derbyshire; received December 1945) and GSM82732 (*Goniatites* aff. *falcatus*, from North Staffordshire; received July 1948) both donated via R.G.S. Hudson; together with a series of specimens numbered between LZ2166 and 2367 received at an unknown date via the Leeds office of the Survey and annotated 'ex Alexander's collection' (mostly brachiopods and bivalves from various Carboniferous localities in Derbyshire and Yorkshire, but including two runs of Jurassic material: LZ2267-2291 from the Lincolnshire Limestone of Northamptonshire, LZ2315-2335 from the Upper Lias of Whitby).

Rock collections contain only a single Alexander specimen: British oolitic limestone MR3317.

# VISITOR BEHAVIOUR AT *THE EVOLUTION OF WALES* EXHIBITION, NATIONAL MUSEUM AND GALLERY, CARDIFF, WALES

by Dale Johnston and Tom Sharpe



Johnston, D. & Sharpe, T. 1997. Visitor behaviour at *The Evolution of Wales* exhibition, National Museum and Gallery, Cardiff, Wales. *The Geological Curator* 6(7): 255-266.

*The Evolution of Wales* is a permanent geological exhibition at the National Museum and Gallery in Cardiff. Opened in 1993, it makes extensive use of video, lighting and sound technology, and a wide range of specimens to show the geological and biological processes that led to the formation of Wales. In the summer of 1995, a detailed study of how visitors behave within the exhibition, and their attitudes towards it, was carried out. The survey aimed more to provide an insight into human nature in geology galleries than to be an evaluation of the exhibition. Both quantitative and qualitative methods were used, including direct observation (behavioural mapping), interviews and visitor comment cards. Using the attracting and holding powers of each display unit, a behavioural map of the gallery has been produced. Based on the survey's findings, suggestions of what factors produce displays that both attract and hold visitor attention are presented.

*Dale Johnston, Woodhorn Colliery Museum, QEII Country Park, Ashington, Northumberland NE63 9YF, U.K. and Tom Sharpe, Department of Geology, National Museum of Wales, Cardiff CF1 3NP, Wales, U.K. Received 14th February 1997.*

## Introduction

During the last ten years, the National Museum and Gallery, Cardiff (part of the National Museums and Galleries of Wales) has staged a number of large temporary geological exhibitions, beginning with the highly successful *Dinosaurs from China* in 1986. (Bassett, M.G. 1987, 1988, 1989, 1990*a,b*, 1991, 1993). These exhibitions were located in the Museum's East Wing in what had previously been the permanent botany and geology galleries. The geological displays, which were removed to make way for the Chinese dinosaurs, dated largely from the 1930s, with some modifications and new case structures in the 1960s. Since 1972 outline plans had existed for a new permanent display telling the story of the geological evolution of Wales. The exhibition was planned to occupy the former geology display area, but after a series of major temporary exhibitions highlighted the need for a space devoted to such events, no area was available for geology.

In 1989 work began on the construction of a new centre block in the Museum's rear courtyard (Bassett, D.A. 1993, Phillips 1992). In addition to new office accommodation for an expanding administration department, the building included two floors of art galleries. After construction was well advanced, the ground floor galleries were given over to natural sciences, and after a wait of 20 years there came an opportunity to build *The Evolution of Wales*. A decision

to proceed was made in the summer of 1992, although funding for the gallery was not confirmed until December of that year. Six design companies were invited to tender for the design and build contract, and in November 1992, Haley Sharpe Associates of Leicester were selected. Protracted negotiations then began between the Museum and the Welsh Office to finalise budgets, and a contract was signed with the designers in April 1993 - just six months before the scheduled opening date.

As plans progressed, two areas which had been intended as shops were also given to the natural sciences. These areas, by the entrance to the new centre block, are detached from the main geology gallery and therefore had to be designed to be used independently. One, on the right of the entrance, became an introductory gallery in which surface processes, volcanoes, earthquakes, and plate tectonics are explained as an introduction to the way in which our planet works; the other was designed as a link between the geology and natural history in Wales galleries and exhibits a wide range of material - plants, animals, fossils, minerals, and rocks - to illustrate the biological and physical diversity of the natural world.

Including these two 'external' galleries, *The Evolution of Wales* occupies an area of about 1200 square metres, and is the largest single exhibition ever produced by the National Museum of Wales (Bassett, D.A. 1993). The total design and build budget was 1.6 million. The

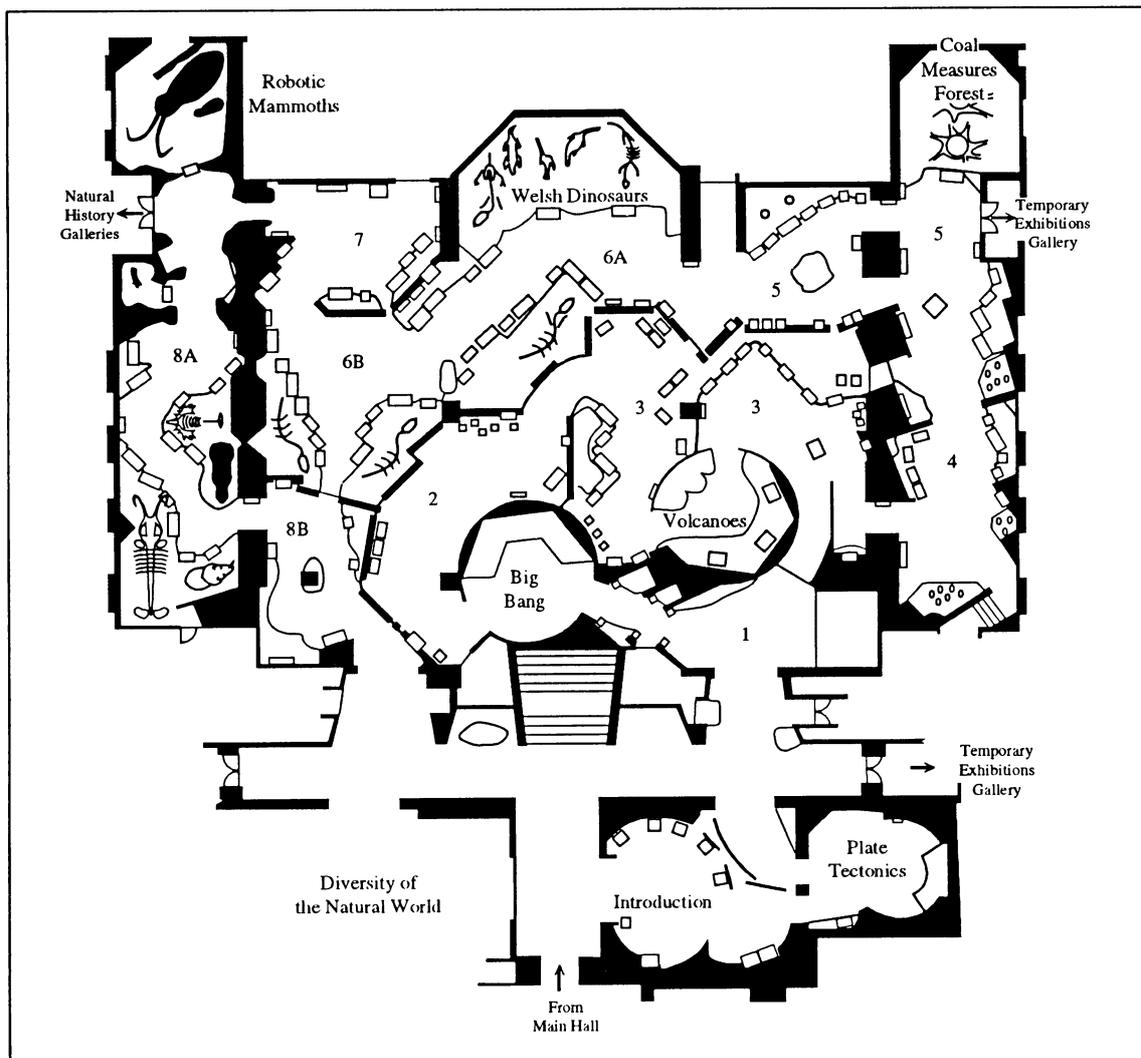


Figure 1. Plan of *The Evolution of Wales* gallery. Numbers relate to the following 'pods': 1: This is Wales; 2: In the beginning (Precambrian); 3: On the edge of a continent (Lower Palaeozoic); 4: Onto the land (Old Red Sandstone); 5: Shallow seas and coal forests (Carboniferous); 6A: Dinosaurs and deserts (terrestrial Mesozoic); 6B: Return of the sea (marine Mesozoic); 7: Emergence of Wales (Tertiary); 8A: The Big Freeze (Pleistocene); 8B: Shaping modern Wales (Holocene).

exhibition uses state of the art audiovisual technology (Anon. 1994), as well as robotic models and fibre optics, and includes 78 minutes of film, much of which is live footage shot for the exhibition on location in Wales and the United States, and specially commissioned animations. These are shown in short films, usually 3 minutes or less in duration, on 31 monitors and 13 video projectors throughout the gallery. Some are single- or multi-screen video projections, with commentary, of spectacular processes such as the 'Big Bang', volcanoes and plate tectonics; other video projections are used as moving backgrounds to displays on coral reefs or coal swamps. Films shown on monitors may have a spoken commentary, or where this may interfere with other nearby sound, subtitles are used.

In addition, 18 channels of sound and 96 channels of controlled lighting provide sound and light effects. Computer interactive exhibits were purposely not used in *The Evolution of Wales*; experience with these in, for

example, *Dinosaurs from China*, showed that they interrupted visitor flow, caused congestion and maintenance problems, and can be used by only a small proportion of visitors at any time.

It was specified to the designers that the gallery must display as many objects as possible, and over 1500, mostly original specimens, have been included. Where possible, larger specimens are on open display, and touchable where appropriate, but smaller specimens are exhibited in 84 specially designed cases. The use of so many specimens is intended to encourage repeat visits, so that there is a chance of seeing something 'new' next time. Further, in some places, specimens or models are deliberately hidden from certain viewpoints. This is designed to allow visitors to discover something they had not seen before merely by standing in a slightly different place on their next visit.

Following an aerial tour of the present Welsh landscape, the visitor steps back in time to the 'Big Bang' and then

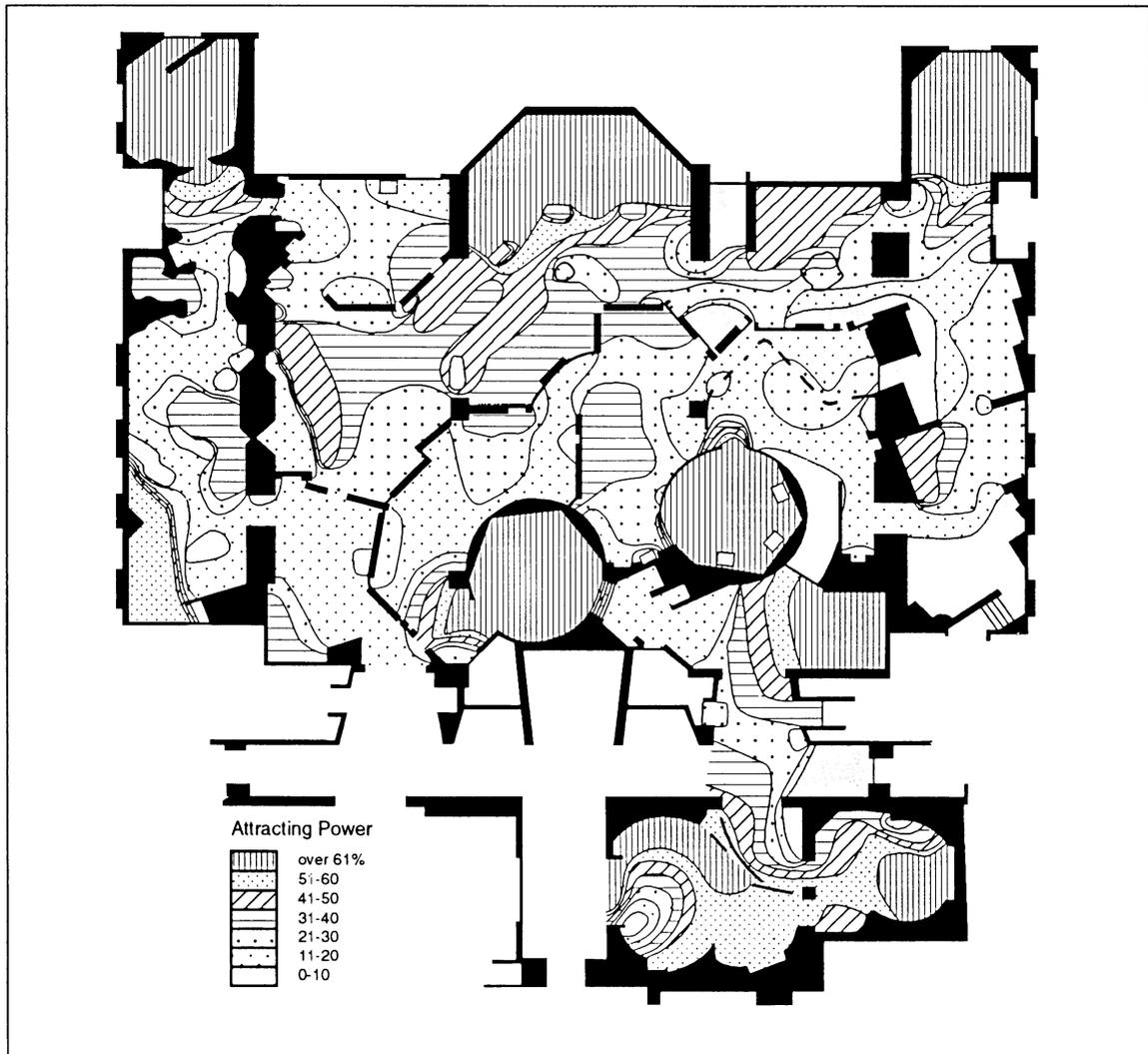


Figure 2. Behavioural map showing the variation of attracting power within *The Evolution of Wales*. Large dioramas or video projections are clearly the main attractions.

proceeds chronologically through the geological evolution of Wales from the Precambrian through to the Recent. The gallery is divided into eight modules, or 'pods', based principally on the prevalent environments at different stages in the geological history of Wales (Figure 1). The modular design is intended to allow flexibility in updating and revising parts of the exhibition during its projected 15 year lifespan. A feeling of space has been maintained through the gallery by the use of free-standing walls; gaps between these allow glimpses of what lies ahead and act to draw the visitor on through the gallery. The total walking distance around *The Evolution of Wales* taking a central line along the meandering route is approximately 135m. The exhibition is designed to be followed in a particular direction, although the building layout and connections with other galleries allow entrance and exit at several points.

Glass panels are used to carry text in a hierarchy of three levels, in varying font sizes. In accordance with the

Museum's policy, all labels and videos in the exhibition are presented in both Welsh and English.

### Visitor surveys

Two visitor surveys carried out on behalf of the Museum in 1994 provided information on initial responses to the new exhibition (Reynolds 1994, William 1994). These surveys revealed a high degree of visitor satisfaction, with visitors spending an average of 45 minutes and in some cases up to 3.5 hours in the exhibition. Feedback was also received on some areas which were less satisfactory, with comments on gallery seating, sound volume and label legibility. William's findings were based on interviews with 100 visitors, using a questionnaire that invited simple short answers. Behavioural information was obtained by asking visitors how long they had spent in the gallery, where they had spent most time, etc. There was no direct observation to verify that the visitors interviewed had actually spent as long in the gallery as they had thought. While a different

set of visitors were sampled in the survey presented here, the results of direct observation seem to suggest that visitors are inclined to think, or at least to say, that they spend longer interacting with an exhibition or specific display than they do in reality. Although these surveys gave information on how the public was reacting to the gallery, they gave no information on how visitors moved within the gallery nor much quantitative assessment of how attractive the displays were.

In the summer of 1995, a new study was undertaken to discover, through direct observation, how visitors behave within *The Evolution of Wales*. In order to keep the research focused, no attempt was made to assess the amount of learning that takes place in the exhibition. Behavioural mapping, semi-structured interviews, and visitor comment cards were used to study visitor behaviour and attitudes.

### Behavioural mapping

Behavioural mapping is the study of where and for how long people stop and pay attention to displays, as well as the routes they take. It is conducted by tracking and observing selected visitors as they move through an exhibition, and timing and plotting their routes. The selected visitors should remain unaware that their behaviour is being observed to ensure that they behave naturally, uninfluenced by feelings of how they ought to behave. Such unobtrusive observation is not a new practice in museums. Alt (1982, p.159) records that 'Sir Francis Galton (1822-1911) reputedly followed visitors as they ambled through the dimly lit corridors of the museums in Victorian England.' Many studies of visitor behaviour have been conducted in the last seventy years, mostly in North America. The classic studies are those of Edward Stevens Robinson (Robinson 1928) and Arthur Melton (Melton 1933 and 1936). In the U.K. similar studies are still rare within the museum environment.

During a two-week period (25 July - 5 August) in 1995, 50 visitors to *The Evolution of Wales* were selected at random and observed as they moved through the exhibition. During each tracking, the following information was recorded:

- (i) Demographic information: gender, approximate age and (where possible) the language normally spoken.
- (ii) Whether the observed visitor was alone, with one other, with a family group or in another form of group, such as a group of friends.
- (iii) Whether videos were running in Welsh, English or not at all (blank screen) at the time the visitor first caught sight of them.

- (iv) Which, if any, open display specimens were touched by the visitor.

For the purposes of this study, the exhibition was divided into 144 display units based on a natural grouping by geological topic and those displays which were viewed collectively by visitors. Throughout this paper the word 'display' is used commonly where 'display unit' may be more appropriate, but clumsy. The amount of material in each display varies considerably and it is important to bear this in mind when making statistical comparisons between them.

Taking each display in turn it was possible to count the number of observed visitors attracted to it. Attraction to a display was taken to mean a look of at least one second; general glancing around without specific interest in any particular display was not counted, though it is recognised that there may be effective learning taking place during such glancing time. These observations provided the basis for calculations of 'attracting power'. The attracting power of a display is defined as the proportion (as a percentage) of visitors to the exhibition who are attracted to that display.

The time spent at each display unit provided the basis for calculating the display's 'holding power'. The 'holding power' of a display is defined here as the median time that the visitors attracted to the display spend looking at it. The median was chosen instead of the mean because, as other studies have also shown (Falk and Dierking 1992, Miles *et al.* 1982), there is commonly a skewed distribution of viewing times at displays. Most displays in *The Evolution of Wales* have many short viewing times (one, two or three seconds), a few medium values and perhaps one or two anomalously long viewing times. For example, the distribution of viewing times for a display of a large millstone was: 1, 1, 2, 3, 3, 3, 4, 4, 5, 8, 45.

The mean ('average') of these times is 7.18 seconds. This is not very representative of the series, as it is distorted by the anomalous value of 45. The median time of 3 seconds is more representative.

### Semi-structured interviews

As visitors were leaving the Museum, semi-structured interviews were used to find out their impressions of *The Evolution of Wales* and how it compares with the other exhibitions in the Museum. A loose structure of questions was used. Some questions were aimed at obtaining quantitative information but most encouraged open-ended answers and allowed follow-up questions to be added spontaneously. In that way the survey differed from fully-structured questionnaire-style interviewing. Time pressures and other factors restricted

the survey size to 35 so the principal value of the interviews was in the qualitative information they produced.

### Visitor comment cards

Visitor comment cards were used as a further means of finding out the views of visitors to *The Evolution of Wales*. The comment cards provided sufficient space for remarks and sketches and requested visitors to give some information about themselves, e.g. where they were from, gender, occupation, and approximate age. They were not asked for their names or addresses as this would have deterred them from providing the more useful demographic information. These cards were made available a short distance beyond the exit from the exhibition. Over the three weeks that the comment cards were left out, 40 were completed. Clearly only a very small proportion of visitors leaving the exhibition chose to share their views, so the comments can only be used as qualitative information. Their views may not necessarily be representative of the wider visiting public but even so they did raise a number of issues.

Most of the comments were more substantial than the 'great!', 'very good' and 'interesting' type of comments often seen in visitor books. There also does not appear to have been much copying of ideas from completed cards of previous visitors, so again the comment cards seem to be a more useful method of assessing visitor attitudes than visitor books. Comment cards are currently being used at Woodhorn Colliery Museum and proving both popular and useful. As a bonus they provide appropriate visitor quotations to spice up committee reports and museum publicity.

## Results of the behavioural survey

### 1. Visitor pathways and behaviour at junctions

Some visitors encountered problems locating the entrance to the main gallery after leaving the introductory gallery, even though it is situated only 8 metres directly ahead. A few managed to locate the exit and went around the main part of the exhibition in the wrong direction.

People prefer to move into parts of the gallery with a visible exit rather than to go into a dead end. When they come to junctions within the exhibition they tend initially to glance right. If there is no overriding attraction or direction arrows to the left or right when entering a gallery, the natural tendency of most people seems to be to go left. This can be observed, for example, as people enter the Diversity of the Natural World gallery (Figure 3).

One explanation for this apparent left bias when moving around galleries may be that it is the result of habits learned from crossing roads and from driving. This suggestion is supported by other observations. Children too young to be street-wise do not display the same behaviour as adults; one child entering the Diversity gallery went to move right towards the mineral displays but her grandfather insisted that the correct way to go was left. There was no sign in the gallery indicating any such 'correct' direction. Here, too, most people go clockwise around the display cases, even though the displays can be viewed in any order. This tendency to go clockwise, interestingly the direction in which we drive around roundabouts, is even shown by those who



Figure3. A visitor turns left into the Diversity gallery.

turn right on entering the gallery. It may be that such behaviour is instinctive.

As might be expected, in North America the reverse pattern of movement within galleries is observed. Melton (1935) noticed that, on average, 75% of visitors in American museums turned to the right upon entering a gallery, regardless of exhibition content or design. It is also recognised that there is a tendency to walk in an anti-clockwise direction around galleries. The pattern in America supports the traffic habits explanation, as suggested by Daifuku (1974) who was commenting on an analysis of visitor behaviour at the Peabody Museum. It would be interesting to see if this holds true in former British colonies where the culture is different from the UK, but where driving is also on the left.

In the case of *The Evolution of Wales*, it is difficult to be certain that the apparent left turn tendency is a genuine one because at each junction the choice of direction could easily be affected by other factors. For example the displays to the left may inherently be more attractive than those to the right, or the arrangement of displays may suggest to visitors that there is a 'correct' way to turn. Testing of the apparent left-turn bias would need to be carried out in other museums to confirm the validity of this observation.

## 2. Visitor approaches to the displays

Visitors spend time glancing around (including upwards at the scenery and lighting rigs) when moving through the exhibition until something grabs their attention. They often stare at a display from several metres away and it is from that distance that they tend to make the decision to go up to it or to walk on. Displays that are eye-catching and easily visible at 'long-range' are therefore more likely to receive interest than those which require visitors to walk close by before they see what is on offer.

Backtracking is a common occurrence, i.e. people do not always view a series of cases in their intended order. For example they may look at the third display in a set of five then go back to the first then perhaps move on to the fourth and fifth.

The design of the gallery allows glimpses through gaps between wall sections to the displays ahead, and observations confirm that visitors do glance through these gaps to see the displays later on in the exhibition, particularly the dinosaurs.

The scope of the exhibition and the large number of specimens on display are intended to encourage visitors to view selectively, and to encourage repeat visits. Again, this is borne out by observation. A few people 'dip' into the exhibition to go to a particular display.

One visitor, for example, went straight to the meteorites and moon rock then went straight back out again.

Repeat visitors can also be identified by the way they lead their friends to see things they could only have known about if they had been to the exhibition before.

Adults seem to adopt a slow, reverential pace. The pace of children is much more variable and unpredictable.

The average time spent in the exhibition was 22 minutes and the greatest time spent in the exhibition by any of the observed visitors was 81 minutes. Relating this to the central line walking distance of the gallery (135 m), the average time spent is nearly 10 seconds per metre. In itself such a figure is fairly meaningless, but could be a useful benchmark for comparison with similar surveys in other galleries. Unfortunately, there are few published data with which this can be directly compared. However, from 1987-89, the Boston Museum of Science carried out a similar evaluation in a natural history gallery which could be considered to have parallels with *The Evolution of Wales* (Davidson *et al* 1991). The exhibition was in a U-shaped gallery approximately 30 by 60 feet and the average time in the gallery after various improvements had been made to it was 5.3 minutes. Allowing for various possible central line distances, this works out as approximately 7.5 to 10 seconds per metre, a similar rate of visitor movement to that found at *The Evolution of Wales*. It is accepted that such a comparison with other galleries is fraught with problems. In North America it has been found that the average maximum attention span for an adult audience is thirty minutes (Dean 1994, p.52). *The Evolution of Wales* therefore has some potential for longer visits, but 22 minutes should not necessarily be regarded as a disappointingly low figure.

## 3. Attracting and holding powers of the displays

On average, any particular visitor is attracted to 21% of the displays in the exhibition; the majority of the displays are only glanced at, or ignored. This is not to say that around 80% of the exhibition is wasted, because each visitor is attracted to a different set of displays. The greatest proportion of the displays looked at by any observed visitor was 65%. This may be a reflection of the size of the exhibition and the density of material in it, or indeed, of human nature.

Only 12 (8%) of the 144 displays attract the attention of more than half of the visitors to the exhibition; 63% of the displays attracted a mere one in five visitors. However, comparison between displays is only reliably possible within the context of their contents, their relative sizes and their position within the exhibition. At the Boston Museum's natural history gallery already mentioned, the main displays had attracting powers mostly in the 55 to 70% range. At the Faraday exhibition



Figure 4. Visitors look down at cases in front of the *Edmontosaurus* skeleton.

at the Science Museum in London it was found that few displays had attracting powers of greater than 40% (Bicknell and Mann 1994). It seems that an attracting power of 40 to 50% may be considered fairly good, 50 to 70% good to very good, and over 70% exceptional. To expect all of the displays in a large exhibition to attract a high percentage of visitors is to be naively optimistic about human nature. Displays are in competition for attention with other neighbouring displays so some will inevitably be more attractive than others.

A major factor affecting the attracting power of any particular display is its location within the exhibition as a whole. In the Introductory Gallery visitors tend to look at a greater proportion of the displays than they do in the rest of the exhibition. Beyond the Introductory Gallery visitors become more selective about which displays to stop at. There is not a simple gradient between the Introductory Gallery and the exit. Rather, the exhibition contains several 'hotspots' at fairly regular intervals interspersed with areas of lower attracting power (Figure 3). There is certainly an element of exit attraction (as termed by Melton 1935) but this is not as strongly developed as it would be in other galleries because visitors to *The Evolution of Wales* do not see the exit until they are within about 5 metres of it.

Where there are specimen cabinets in front of large open displays such as cases in front of dinosaurs, visitors tend to spend more time looking down at the specimens in the cabinets than up at the larger specimens behind (Figure 4). This is especially true where there

are cabinets in front of specimens which are suspended above normal viewing height, as in the case of some free-hanging skeletons of marine reptiles. However, such large specimens are more commonly viewed from a distance, and are also seen by visitors where they have a view through parts of the gallery.

The displays in the immediate vicinity of a particularly popular display, such as the volcano pod, suffer from having the visitors' attention drawn away from them towards the 'celebrity' display. Put a different way, very attractive displays draw attention away from neighbouring displays.

The average holding power for the displays in *The Evolution of Wales* is 5.9 seconds. There is therefore very little time for presenting an educational message. Long text may be appreciated by a few visitors, but most will not read much, if any, of a lengthy label. Although *The Evolution of Wales's* text panels, with about 150 words of English, are hierarchically structured, so that the visitor can choose how much detail to read, the overall impression is of a lot of text. This is a particular issue in the National Museums and Galleries of Wales where the text must be presented bilingually. The designers attempted to get round this problem on glass panels by blocking the Welsh text on a dark background, and printing the English text directly on the glass. The effect, from a distance, is to give a less daunting appearance.

Only 14 of the 144 displays had holding power values greater than 10 seconds. Over three quarters (77%) of the displays failed to hold visitors' attention for more

than five seconds. It is possible, however, that visitors are taking in more than it seems. Studying how visitors read display labels McManus (1989) found that although only 12.5% of visitors were observed to read attentively and another 39.1% made brief glances at the text, over 70% of visitors were overheard using label content in their conversations.

As with attracting power, but to a lesser extent, the holding power of a display is partially influenced by its position within the exhibition. Four of the ten most strongly holding displays are in the Introductory Gallery while four of the ten most weakly holding displays are in the final pod of the exhibition.

A comparison of the attracting (A.P.) and holding powers (H.P.) for each display shows that some displays, for example the Welsh dinosaurs (A.P.= 71%, H.P.= 5 seconds), are very attractive but lack strong holding power. Conversely others, such as a case entitled Mineral wealth (A.P.= 20%, H.P.= 13.5 seconds) have poor attracting power but relatively good holding power.

Some displays almost inevitably attract visitors' attention. For example, visitors must walk through the Big Bang and Volcanoes pods to proceed through the gallery, and in so doing are caught by the spectacular film and animations projected onto multiple screens. Displays such as the Coal Measures Forest and the Mammoth are particularly large and so by their very nature will be more likely to attract attention to themselves.

The most successful displays (in terms of attracting and holding power) seem to be those involving: a strong visual stimulus, especially movement; sound; a favourable location within the exhibition; and intrinsic interest.

All but two of the ten most popular displays for holding power involve some form of motion. In the case of a seismometer in the Introductory Gallery, the movement of the needle is very slight but visitors do notice it. Similar interest in the motion of exhibits has been observed in zoos. Bitgood and Benefield (1987, p.6), studying visitor viewing times found that 'viewing time was approximately twice as long when the animal was active than when it was inactive.' This corroborates the findings of Washburne and Wager (1972) who reported above-average interest being shown by visitors at displays involving motion, changing lights and recorded sound.

Psychological research into the process of perception has shown that people selectively focus on certain specific stimuli while screening or filtering out others (Mullins 1996, p.143). Mullins, like Washburn and Wager, reports that 'there is usually a tendency to give

more attention to stimuli which are, for example: large; moving; intense; loud; contrasted; bright; novel; repeated; or stand out from the background.' It should be remembered that an individual's process of selection when it comes to displays (or anything else) will also be affected by 'internal factors' such as personality, motives, preferences, expectations and previous experiences.

Some displays, such as the active seismometer appear to have an addictive quality. People often look at them for a time then look away at something else before finding their attention drawn back to the display once more. This second (or third) look may last longer than the first. This addictive quality seems to be a valid indicator of the success of a display though it is not something that can be measured easily.

Even if people have little time to visit the exhibition they still spend a similar amount of time at the displays as those in less of a hurry. However, they stop at fewer displays and tend to move more quickly between their selected few displays.

Under 16 year olds and 40 to 65 year olds on average spend almost twice as long looking at each chosen display as 16 to 40 year olds. This is probably because many of this latter group are parents accompanying their children. Consequently their attention to displays is frequently broken by the need to check what the children are doing. This may happen subconsciously at times. While spending less time at specific displays, the 16 to 40 year olds are attracted to a greater proportion of the displays in the exhibition than the under 16s or the 40 to 65s.

#### 4. Visitor reaction to the use of film

If a video monitor is blank, visitors usually do not wait for longer than about a second to see if the video will start, i.e. people have little patience for blank screens. If a video is not running when visitors first see it, they tend to assume that the blank screen indicates that it is not working. It is therefore important that reset times between programmes are as short as possible. If a video (whether with verbal commentary or subtitles) is running when people first see it they may watch to the end, but with the exception of a few very popular videos (like the plate tectonics, Big Bang and volcano videos) they usually do not wait for it to restart in order to see the parts they missed. Since this visitor research was carried out, the interval time between programmes has been reduced to 2 seconds.

The length of time that people spend at videos which have commentaries is critically dependent on the language in which the commentary is being given when they arrive at it. If a visitor's native language is English and a video is showing with a Welsh commentary, the

usual reaction is to stop for a second or so but then keep on walking. The reverse was true for the single entirely Welsh-speaking family surveyed. Some people (perhaps bilingual or those from overseas whose knowledge of English is not much greater than that of Welsh) watch the videos in either language, whichever happens to be showing at the time. Where visitors wait at a blank screen for a video to restart and then it comes on in Welsh the normal reaction is to express disappointment and walk away. The same thing happened with the Welsh-speaking family when the English version of a video commentary came on.

Videos with spoken commentaries are considerably more popular than those with only subtitles. None of the subtitled videos was watched in its entirety by any of the 50 observed visitors. The greatest proportion watched of any silent video was 58%. The average holding power of the silent videos was just 6.4 seconds of their average length of about 2.5 minutes. Subtitled videos are used in the gallery where other sounds would interfere with a commentary, such as close to the volcano pod.

### 5. Tactile tendencies

Where specimens in the gallery are within easy reach, they are designed to be touched (Figure 5). Some people have a tendency to touch most objects in the



Figure 5. A visitor touches a large polished slab of petrified wood.

exhibition that can be touched, while others do not touch anything. The two most favoured materials within the exhibition for touching are fur (such as on a stuffed bison) and polished pieces of rock, such as a slab of fossilised wood). Of the people attracted to the bison, half of them stroked it. This tactile tendency is shown by people of all ages but it was noticeable that a few parents told their children not to touch anything. It is probably this tactile tendency combined with curiosity that makes interactives popular. Strangely, in spite of the tendency to reach out and touch things, very few visitors chose to sit on a large sandstone block intended as a seat.

### 6. *The Evolution of Wales as a social experience*

People of all ages visited the exhibition although it was noticeable that there were few visitors in their mid to late teens and few over 65s. Many of those over 25 come with their children or grandchildren. This broadly reflects the visitor profile of the Museum as a whole, where less than 3% of visitors are in their late teens, and 16% over 65. A quarter of the Museum's visitors are aged between 35 and 44.

Most visitors look around the exhibition with at least one friend or relative. Few people (18% of those observed) visited alone. Where visitors are in pairs or groups sometimes an individual will adopt a leadership role, while others in the group will act, probably subconsciously, as followers. Often in a family group the 'leader' is one (or both) of the parents or grandparents but it is not uncommon to see the children do the leading. Where this 'leader-follower' scenario exists it can have a significant effect on the way the 'follower' interacts with the displays. The time that the follower is spending at a display is often prematurely ended by a call to go over to another display.

The displays stimulate a considerable amount of conversation. A satellite image of Wales for example was used by a Welsh visitor to show his overseas friend where in Wales the Welsh language is most widely spoken. Adult visitors generally talk in hushed tones except when excited or calling to someone; children have no qualms about talking loudly! Children call parents over to displays they find exciting; parents call children over to displays they think are important. The accuracy of the information passed between adult and child, however, is dubious. When children ask their parents or grandparents a question relating to the displays, they seem to assume that they will get an accurate answer. When the adults cannot answer, they tend to bluff rather than admit they do not know.

## 7. Time for displays compared with time for other things

On average, visitors spend more time glancing around, walking between displays and interacting with the other people in their group than they do looking intently at the displays. The average proportion of time in the exhibition spent actually examining displays is 44%. Combined with the average time in the gallery of 22 minutes this means that on average each visitor spends just 10 minutes interacting directly with the displays. Intently looking at the displays is therefore just one component within visitor agenda. This could be regarded as a negative thing, but it is more likely a reflection of visitors coming to the exhibition, or the museum as a whole, principally as a social experience. As well as direct education, learning probably results from the discussion of geology-related topics generated by the displays. Relationship-building is also presumably occurring, and these are clearly benefits that exhibitions offer visitors. The loss of these benefits is worth bearing in mind when considering the use of audio guides or any other technology which prohibits social interaction.

## 8. Visitor attitudes and expectations

Results of semi-structured interviews and comment cards *The Evolution of Wales* as a whole (and specifically its layout) was praised by many visitors. One of the exit survey interviewees 'liked the way it took you through from the past to the modern day'. Of the 35 visitors interviewed on leaving the Museum 89% said that they had been in the *The Evolution of Wales* galleries during their visit. This compares with figures of 86% for both the natural history and art galleries, 51% for the archaeology & numismatics galleries, and 46% for the Anthony Gormley temporary art exhibition *Field for the British Isles* current at the time of the survey. Several visitors who completed comment forms said that they had been to the exhibition before and would return again. This indicates a high level of satisfaction.

The same visitors were asked to list the exhibitions they had seen (not necessarily on this visit alone) in order of preference. An overall 'popularity value' for each exhibition was calculated using 6 points for a first choice, 5 points for a second choice etc. If an exhibition was not visited it received no points for that particular visitor. These calculations showed that *The Evolution of Wales* and the natural history and art galleries are of similar popularity and significantly more popular than the other exhibitions. It should be pointed out that the archaeology galleries are awaiting redesign so it would be unfair to judge the relative popularity of the subject based on its performance here.

## Popularity value

Natural history in Wales	133
<i>The Evolution of Wales</i>	131.5
Art (including ceramics)	121
Archaeology & numismatics	72
Temporary exhibition (art)	63
Man & the Environment	51

Because the interviewing was principally to obtain qualitative information rather than statistics the sample size was fairly small. Others may wish to carry out similar surveys in multi-disciplinary museums using a larger sample of visitors.

## 9. *The Evolution of Wales*, a source of amazement

Especially after watching the plate tectonics video (including an animation showing the movement of Wales across the globe) visitors made 'wow!'-type comments. One elderly lady was heard to say 'You can't take it in that it has happened.'

It is clear that people try to link what they are looking at with something they can relate to. At the Irish giant deer one teenage girl exclaimed 'It's a moose!', connecting what she was seeing with something she was already familiar with. Along similar lines one young boy pointed at the coprolite specimens and said 'Oh, dinosaur poo!'

'Is that real?' was a commonly asked question when looking at the specimens in the exhibition. This is especially true of the dinosaur bones. Contrary to expectations, people seem to assume that a bone is not real unless it is stated that it is.

Once it is realised that a specimen is made of real bone the usual visitor response is a dramatic increase in their level of interest in the display. There is also a greater appreciation of the object's value. This was noticed through interviewing and also by watching the responses of visitors to the pro-active approach taken by some warders.

Some people have an expectation of finding interactives and having buttons to press. While waiting for the plate tectonics video to restart one woman said, 'Isn't there anything to press?' Rather than being pleasantly surprised if interactives are included in an exhibition, it now seems that young people especially are disappointed if they are not. On the comment cards two children expressed their disappointment at the lack of computers with which to play.

The greatest source of criticism in the exhibition is the labelling which in places (particularly with specimen labels in cases) is too small to be read easily or is marred

by shadows. Titles to the pods, often written vertically, were also criticised as being difficult to read. Two teachers said that the content of the exhibition 'is a bit deep for primary school children but is good for secondary schools.' They also reported difficulties they had encountered with the Museum's worksheets: 'the children couldn't have used them if we hadn't been with them.'

## Conclusions

Motion and sound are keys to improving both the attracting and holding power of a display. The apparently greater attraction of wide-screen videos and robotic models over real specimens may not be simply the result of differences in intrinsic interest. A better explanation for the popularity of features such as the Big Bang pod and the robotic mammoths is their size, novelty value and strategic positioning within the gallery. If exciting (not necessarily high-tech.) exhibition techniques involving sound and motion were applied to real specimens they too would have higher attracting and holding ability. While few geological objects lend themselves to audio displays, many could be displayed more interestingly for instance by simply rotating them on a turntable to introduce an element of motion.

The attention span of most visitors for videos with subtitles instead of audio commentaries is very low. Videos of this nature should be kept short (certainly no longer than 30 seconds), or avoided altogether.

Monitors presenting a blank screen between presentations create the impression that they are not working, and this could detract from an otherwise exciting gallery atmosphere. Some message should appear between presentations so that visitors know that waiting would be worthwhile. The length of gaps between presentations should be no longer than a few seconds because people are not usually prepared to wait for long in front of an inactive video.

If any bones (e.g. those of a dinosaur skeleton) in a display are real, they should be labelled as such. Visitors show considerably more interest in the real thing than they do in what they perceive to be a good replica.

If you want visitors to look at a particular object or group of objects, then limit the number of competing attractions in the immediate vicinity. Where there is something that you want people to look up towards, it is a good idea to avoid having display cases nearby that cause people to look down instead. What visitors see can be best controlled by restricting their options. However, some visitors may prefer to have some choice in what and how they view.

Every opportunity should be taken to relate specimens to areas with which people are familiar. This can be done within labels and text panels as well as through pro-active warding which is a very useful means of interpreting displays, benefiting visitors and warders alike.

The exhibition space is not merely a place of learning and inspiration but also of social interaction. Most visitors spend more time in conversation, glancing around or walking between displays than they do looking at displays themselves.

## Final remarks

The exhibition, while having its faults, has been successful in its aims to appeal to a wide range of people and to encourage repeat visits. One of the biggest strengths of *The Evolution of Wales* must be the exciting image of geology that it presents. It certainly appeals to museum visitors seeking inspiration and enjoyment as much as information. Much of the information reported in this paper has been condensed from a larger set of data, and visitor comments. Further details about visitor behaviour at specific displays within *The Evolution of Wales* or about the research methods are available from the first author.

## Acknowledgements

We are grateful to the following for their help and comments during the survey and the preparation of this paper: Stephen Howe, Bob Owens, Mike Bassett and Jennifer Stewart; Eileen Hooper-Greenhill, Judy Johnston, Angela Houghton, Catherine Jones, Jim Wild, and Gaye Evans who prepared the plans of the gallery. Thanks are also due to the many visitors to the exhibition who contributed to this research.

## References

- ALT, M.B. 1982. Designing and carrying out the evaluation study. In Miles, R.S. et al. *The design of educational exhibits*. Allen and Unwin, London, 144-170.
- ANON. 1994. Earthly pleasures. *Audio Visual* 267, 14-16.
- BASSETT, D.A. 1993. Wales in miniature. *Amgueddfa* 16, Special Edition, 36pp.
- BASSETT, M.G. 1987. Dinosaurs from China (at the National Museum of Wales). *Geology Today* 3(6), 186-189.
- BASSETT, M.G. 1988. Dinosaurs from China: an exhibition at the National Museum of Wales. *Nature in Wales*, New Series 6 (for 1987), 23-33.
- BASSETT, M.G. 1989. Dinosaur update...dinosaur update. *Amgueddfa* 5, 5.

- BASSETT, M.G. 1990a. Dinosaurs - a monster attraction: two summer shows in Cardiff. *Amgueddfa* 6, 3.
- BASSETT, M.G. 1990b. More from the Dinosaur Diary. *Amgueddfa* 8, 8.
- BASSETT, M.G. 1991. Mammoths and the Ice Age. *Amgueddfa* 11, 5.
- BASSETT, M.G. 1993. Prehistoric sea monsters. *Amgueddfa* 15, 5.
- BICKNELL, S. and MANN, P. 1994. A picture of visitors for exhibition developers. In Hooper-Greenhill, E.(ed.), *The educational role of the museum*. Routledge, London, 195-203. Reprinted from Thompson, D., Benefield, A., Bitgood, S., Shettel, H. and Williams, R. (eds), 1992. *Visitor studies: theory, research and practice, volume 5. Collected papers from the 1992 Visitor Studies Conference (St Louis, Missouri)*. Jacksonville, Alabama: Visitor Studies Association.
- BITGOOD, S. and BENEFIELD, A. 1987. *Visitor behavior: a comparison across museums*. Technical Report No. 86-20, Jacksonville, AL
- DAIFUKU, H. 1974. The museum and the visitor. In *The organization of museums: practical advice*. UNESCO Museums and Monuments Series, IX, 73-80.
- DAVIDSON, B., HEALD, C.L. and HEIN, G.E. 1991. Increased exhibit accessibility through multisensory interaction. *Curator* 34(4), 273-290.
- DEAN, D. 1994. *Museum exhibition theory and practice*. Routledge, London, xi + 177pp.
- FALK, J.H. and DIERKING, L.D. 1992. *The museum experience*. Whalesback, Washington D.C, xvii + 205pp.
- McMANUS, P. 1989. How museum visitors read labels and interact with exhibit texts. *Curator* 32(3), 174-189.
- MELTON, A.W. 1933. Some behaviour characteristics of museum visitors. *The Psychological Bulletin* 30, 720-721.
- MELTON, A.W. 1935. *Problems of installation in museums of art*. American Association of Museums, Washington D.C., New Series 14.
- MELTON, A.W. 1936. Distribution of attention in galleries in a museum of science and industry. *Museum News* 14(3), 6-8.
- MILES, R.S., ALT, M.B., GOSLING, D.C., LEWIS, B.N. and TOUT, A.F. 1982. *The design of educational exhibits*. Allen & Unwin, London, xviii + 198pp.
- MULLINS, L.J. 1996. *Management and organisational behaviour*. London: Pitman Publishing, xxi + 810pp.
- PHILLIPS, J. 1992. New extension nears completion at Cathays Park. *Amgueddfa* 13, 14-15.
- REYNOLDS, P. 1994. *National Museum of Wales, Cathays Park, Cardiff. Visitor research survey, Spring 1994. Tabulated results, full sample, key findings and report*, 36pp. (unpublished).
- ROBINSON, E.S. 1928. *The behaviour of the museum visitor*. American Association of Museums Publications, New Series, 5, 72pp.
- WASHBURNE, R.F. and WAGER, J.A. 1972. Evaluating visitor response to exhibit content. *Curator* 15(3), 248-254.
- WILLIAM, C. 1994. *The Evolution of Wales exhibition. Results of the survey carried out from February to June 1994*, 25pp. (unpublished).

# MUSEUMS & GALLERIES COMMISSION STANDARDS IN THE CARE OF MUSEUMS COLLECTIONS: WHAT ARE THE IMPLICATIONS?

by Crispin Paine



Paine, C. 1997. Museums & Galleries Commission Standards in the Care of Museums Collections: what are the implications? *The Geological Curator* 6(7): 267-268.

Crispin Paine, Museums & Galleries Commission, 16 Queen Anne's Gate, London SW1H 9AA, U.K. Received 14th September 1994.

Standards are still fashionable. The Citizens Charter may be quietly fading away, but there are plenty of other Standards taking its place in seemingly every sphere of life. Total Quality Management and Investors in People are at one end of the scale, British or European or International Standards for electrical wiring, if you like, at the other end.

In the Museums world much of the running has been made by the MA through its Codes of Practice. The MTI's performance standards, now they are incorporated in the new NVQs, will have an even bigger impact. But there is still no equivalent for us to BS 5454 (British Standard) which has revolutionised how archives have been run over the past generation.

Five years ago or so the Museums and Galleries Commission introduced the Registration Scheme. This is a basic standards scheme, and personally I'm delighted that it's now going to stay that way in Phase 2.

But there was a feeling that a set of higher standards was needed, to set out good practice, if not the very best practice, at which Registered museums should be aiming.

So the *Collections Care Standards* were born. Archaeological and Biological Collections were published in 1992, Geological Collections in 1993, Larger and Working Objects a few months ago, and I'm just doing the final draft of Musical Instruments and beginning to think about Photographs.

I hope many of you are familiar with the *Biological* and *Geological Standards* in particular. I should be very glad to know if they have been at all useful, and how they could be improved.

We started in each one by forming an Expert Group, including conservators and curators from museums

---

Paper delivered at the 'Orphan Collections' Seminar, during the Museums Association Conference, Brighton, England, 12th September 1994.

large and small around the country, plus a few specialists from outside museums. They are the people who basically wrote the documents, and once they were fairly satisfied, a draft was sent out for consultation to a very wide range of people.

I've been very forcibly struck by the level of consensus the Expert Groups and those consulted have reached. Yes there have been arguments and compromises, but on the whole there is a real professional consensus in this country on how to look after museum collections.

Each booklet is in two parts. Part 1 covers the management of collections: collecting, curation, access, documentation and so on. Part 2 covers what we've called protecting them: security, environment, storage and so on. And each booklet includes the *Standards* themselves, guidelines and notes and sources of help and advice.

Each booklet, too, stresses the issues particular to that subject, thus in biology for example loans get a lot of attention, and there is a special section on live collections.

The most difficult aspect has been deciding just how high to pitch the *Standards*. Make them too hard to reach and they will be ignored; make them too low, and they will fail in their purpose to help museums do even better.

We've used the word 'aspiring'; the *Standards* are those all museums should be aspiring to reach, though some smaller museums may take a long time to get there.

In the Introduction to each booklet we've set out examples of some of the ways in which it might be used. Essentially, we see these *Standards* as a quarry, from which museum workers can dig what they most need.

Now that four *Standards* have been published, and a fifth is almost finished, the Commission is thinking it is time to review the programme, and to ask whether the present format is the most effective.

After all, there have been criticisms. The biggest one of course is that the *Standards* are out of reach of ordinary impoverished understaffed museums. Personally I think that this is sometimes exaggerated: if you read carefully, you will find lots of let-out clauses and weasel-word escape hatches. A huge amount of effort has gone into making the *Standards* carrots rather than sticks.

Here we come to the core of what this seminar is all about. What do the *Standards* say about the staffing of natural and earth science collections?

The *Standards for Geological Collections* say (3.2):

All museums with geological collections must have access to the advice of a trained and experienced geological curator, and collections should be inspected on a rolling programme.

Those for *Biological Collections* say (3.2):

All biological specimens must be inspected by a trained and experienced museum biologist on a rolling programme.

And this *Standard* is backed up by a note (3.5):

A museum with an active collecting policy, with substantial natural history collections (perhaps 40,000 individual specimens) or with scientifically important collections should have a biology curator with a specialist expertise in at least one of the classes of material predominant in the collections. Smaller museums without a biologist on the staff should either deposit their biological collections in a museum which has, or should contract regular visits by an appropriate museum biologist (curator, conservator or taxidermist) from elsewhere. Museums without regular access to the advice of a museum biologist should adopt an extremely cautious approach to the acquisition of biological collections.

Thus for curation at least, the smallest museum should be able to meet the Standard. Still, if people feel the *Standards* are out of reach, then that is a real problem that we must address.

Other criticisms are of the format: why not, for example, take out those *Standards* that are common to all the booklets and publish a generic *Standards for Collections Care*?

The review which is currently going on in the smoke-free rooms of the Commission is asking three questions:

1. How do these *Collections Care Standards* fit in with all the other Standards which are coming out? For example, British Standards, Citizens Charter, Investors in People, or in the museums sector Spectrum, the MTI's National Vocational Qualifications, or the Commission's own *Standards for Customer Care, Touring Exhibitions* and above all Registration?
2. How can these *Standards* be supported? It is all very well publishing rules, but how can the Commission help

museums, especially smaller museums, to meet them? It's already been decided that the Commission must get going a Standards Implementation Programme. Now we are discussing exactly who does what. Clearly the AMCs will be involved, and I hope the Specialist Groups too, particularly in training programmes and producing back-up publications.

3. Should *Collections Care Standards* be graded? Should there be, for example, a range of levels for the housing of geology collections, from rock-bottom-basic-just-got-Registered level, to the sort of conditions you would expect to find in the Natural History Museum?

We've all been inspired by Janet Kenyon's Yorkshire and Humberside survey of social history collections. She had the (to my mind) brilliant idea of setting out five levels of achievement in the different aspects of collections care. For example documentation goes from "Complete MDA standard of documentation system" at the top down to "No or very little documentation" at the unacceptable bottom.

If you think about it, there are all sorts of implications here. Collections audits are becoming increasingly important and fashionable. They clearly need to be able to grade standards of collections care, and the Commission is organising a pilot scheme in Northern Ireland, which I gather is just starting, to look at the implications. There's a seminar on condition surveys taking place here tomorrow, when I hope we'll learn a lot more.

It will be vital that the experience of biologists and geologists, who have done so much to develop a methodology for collections surveys, should be taken on board. We have heard this morning about the magnificent achievements of FENSCORE, and of peripatetic curators like Simon Timberlake in the South East and Mark Simmons in the North East.

Beyond lies the much wider question of a national grading system for museum collections. At the Liverpool Conference last year Richard Foster floated the idea of national funding for nationally important collections. We'll have to wait and see whether government is willing to take up the idea, but there has been a lot of talk about it over recent months.

But if we grade museum collections, do we then grade the care we give them? Standards in Museums have a long way to go yet.

May I end by repeating the invitation to comment, both on the present booklets or on the way they should develop in the future? Any comments, views, suggestions you may have will be genuinely very welcome and taken very seriously. Please let me know, or Peter Winsor at the Commission.

# THE BCG/GCG ORPHAN COLLECTIONS WORKING PARTY REPORT: PREAMBLE

by Steve Thompson



Thompson, S. 1997. The BCG/GCG orphan collections working party report: preamble. *The Geological Curator* 6(7): 269.

Steve Thompson, Scunthorpe Museum and Art Gallery, Oswald Road, Scunthorpe, South Humberside DN15 7BD, U.K. Received 9th January 1997.

The BCG/GCG orphan collections working party report has purposely been kept short, the main part being only three pages long, in order to enable it to be read and understood quickly. This has meant, however, that a great deal covered in the preliminary discussions has had to be left out. This brief communication gives some background information to the report.

The report outlines the present situation with regard to those natural science collections that do not, at present, have specialist curators to look after them. There are a range of issues that are directly related to any action that may be carried out on these collections. These include details of the possible courses of action open to institutions, details of an overall strategy, the implications for institutions with such collections, timescales over which work may be carried out, which organisations or types of organisation may need to be involved and, of course, the costs of carrying out the work. However, as the aim at this stage was simply to state the problem relating to orphan collections, we felt that these issues should not be included in this report.

As part of the work carried out, two seminars were organised. The first of these was held at the 1994 Museums Association (MA) conference, one result of which was the production of the report itself. The second was held at the 1996 MA conference, when the final draft of this report was presented. This was, at least in part, to gauge the reaction of the delegates to the subject and the report. The result was most encouraging, and the presentation generated some lively discussion. Although organised by two natural sciences groups (the Biology and Geology Curators' Groups), both the attendance and the discussion were marked by a strong, even dominant, presence of non-natural scientists, who

furthermore included senior museum and area council personnel. It seems clear that there was a great deal of interest, both in the value of this work to all museum disciplines, as was intended, and in the possibility of a practical strategy to deal with what seems to be a ubiquitous and intractable problem in museums.

The next step following publication of the report should be to put together a working party charged with examining all of the above issues in order to create a strategy that will address the problems of orphan collections. This will need to include methodology, options, costings, fundraising and marketing, and no doubt other factors as well. Members of the working party are likely to include representatives from the Museums and Galleries Commission, the Department of National Heritage, the Area Museum Councils, the Biology and Geology Curators' Groups, the Natural Sciences Conservation Group, the Collections Research Units, the Museums Association, and perhaps the institutions themselves. The working party might expect to meet two or three times a year, and one could not expect a useful result in less than a year.

One final point, on the subject of names. It has been pointed out that the use of the term orphan is perhaps unwise, especially as the aim to promote the long term care of collections, even where successful, does not necessarily mean they will gain their own specialist curator. It may well be more appropriate, therefore, to drop the term orphan and take the initiative forward from the perspective of putting in place minimum standards of care for collections, across the board, but with particular reference to those that are currently without specialist care at present.

# THE BCG/GCG ORPHAN COLLECTIONS WORKING PARTY REPORT

by C. Collins, J.A. Cooper, R. Roden, M. Simmons, S. Timberlake and S. Thompson.  
Edited by S. Thompson.



Collins, C., Cooper, J.A., Roden, R., Simmons, M., Timberlake, S. and Thompson, S. 1997. The BCG/GCG orphan collections working party report. *The Geological Curator* 6(7): 271-273.

*Chris Collins, Geological Conservation Unit, Department of Earth Sciences, Downing Street, Cambridge CB2 3EQ, U.K.; John Cooper, Booth Museum of Natural History, 194 Dyke Road, Brighton BN1 5AA, U.K.; Rosemary Roden, Pine Ridge, 110 The Ridgeway, Astwood Bank, Redditch, Worcestershire B96 6NA, U.K.; Mark Simmons, Perth Museum, 78 Georges Street, Perth PH1 5LB, Scotland; Simon Timberlake, U.K.; Steve Thompson, Scunthorpe Museum and Art Gallery, Oswald Road, Scunthorpe, South Humberside DN15 7BD, U.K. Received 9th January 1997.*

## Introduction

In September 1994, a seminar was organised at the Museums Association (MA) conference, by the Biology Curators' Group (BCG) and Geological Curators' Group (GCG), to address the problem of the many natural science collections in the UK that do not have professionally trained curators.

If collections are uncurated they are effectively inaccessible. The museum loses part of its basic resource while the scientific community loses valuable data. The collections are likely to deteriorate, making them progressively more difficult to bring back into use. The status quo is **not** being maintained by simply doing nothing.

Among the recommendations made at the 1994 seminar was that a report should be produced to summarise the findings made by a joint working party, with a view to generating activity. This report looks at the extent of the problem, the way it has been tackled so far, the reasons for acting, some possible solutions and, finally, makes a number of recommendations.

### Why care?

1. Specimens and collections are important even when they lose their curator. Some material (eg. type material) is irreplaceable.
2. All collections, curated or otherwise, are part of a national resource and our national heritage.
3. It is difficult to define the future importance of the material in our care.

4. The ability to use a collection depends on good curation. Owners will attach more importance to a well cared-for collection that can be used.

5. The profession has stated a commitment to the national resource of collections by publishing standards, codes and guidelines.

### Some Standards, Codes and Guidelines

Numerous documents have been published within the last ten years indicating a commitment to the care of all the collections within our museums as part of a national resource and our collective cultural heritage. These include:

#### **Museums Association (MA):**

- *Code of conduct for museum professionals.*
- *Code of practice for museum authorities.*

#### **Museums & Galleries Commission (MGC):**

- *Registration scheme.*
- *Standards in the Museum Care of Geological Collections.*
- *Standards in the Museum Care of Biological Collections.*

#### **Geological Curators' Group:**

- *Guidelines for the curation of geological collections.*

#### **Museum Documentation Association (MDA):**

- SPECTRUM.

#### **Collections Research Units:**

- Regional surveys and reports on natural science collections.

#### **Geological Society:**

- *The Value and Valuation of Natural Science Collections*

## The Extent of the Problem

Two reports, "The State and Status of Geological Collections in the UK" (Doughty 1981) and "Biological Collections UK" (MA, 1987) already provide an overview of the problem. The regional Collections Research Units (CRU's) have also assessed both the extent and the nature of the problems.

*The State and Status of Geological Collections in the UK.* (Doughty 1981)

1. There are estimated to be three million specimens outside the national museums.
2. More than 50% of museums have collections which are poorly documented.
3. 35 museums with type specimens have no curatorial cover.
4. More than 65% of museums with geological collections have no curatorial cover of any kind.

*Biological Collections UK* (MA 1987)

1. 35% of museums with biological collections have no staff trained in biological curation.
2. 1-2.5 million specimens are estimated to be without specialist curatorial cover (orphanised).
3. At least 30% of institutions hold type or figured material.
4. Around 50% of orphan collection institutions still receive natural history material.

The peripatetic geology curators for the South East Area Service (1985 - 1995) surveyed all the museums in that region. They found that 1.5 million geological specimens were without curatorial cover and that 186,000 were in need of remedial conservation.

A comprehensive CRU project in the North West found, after surveying 61 institutions with natural science material, that 29 museums had no natural science curator and 4 had no curator/skilled carer at all. This corresponds to roughly 270,000 specimens.

If the North West is a reasonable average for the UK as a whole, but weighting the figures for the SE, we get a national total of around 5 million specimens, with 370,000 in need of remedial conservation.

## Past Strategies

*Peripatetic curators.* These have usually been attached to Area Museums Councils, (AMC's), as in the North East and South East, and always on a temporary basis.

*Volunteers.* Many are very competent and committed, but quality cannot be guaranteed if there is no qualified curator to supervise their efforts.

*Community programme and work experience schemes* draw upon inexperienced people and with little hope of

long term commitment. Again proper supervision is required for quality assurance.

*Freelance workers.* Suitably qualified and experienced people are taken on for a limited period of time, to do very specific tasks, on a one-off basis. This does not cater for the long term needs of the collections but should at least promote the status quo.

A part solution has been for groups such as CRU's to offer advice, allowing museums to put out work without having to be able to put in the initial evaluation effort themselves.

The principle problem with all such schemes has been the lack of consistency, continuity and long term provision for the collections.

## Future Solutions

There are many possible options. Many of the attempts so far have been on an individual, independent and ad-hoc basis, and it seems apparent that these will not serve as a long term solution to the problems. A more unified regional or national scheme is needed and we feel that the best long-term option is likely to be a major national initiative, though is not the purpose of this report to describe such a scheme.

It is expected that the work would be carried out by existing operators, such as AMC's, CRU's, volunteers, etc, making the initiative an umbrella for many small projects. This should promote the flexibility and adaptability of individual solutions. Any help offered would be conditional on the receiving institution guaranteeing the long term maintenance of the collections. The use of the collections should also be promoted as part of the package.

Ideally, all collections, not just natural science collections, should be catered for. However, natural science represents a more or less self contained set of collections and expertise, is large enough for economies of scale to be significant, but small enough to act as a potential pilot project, to be later developed for other subject areas.

## Solutions for individual collections

1. Employ a full time, qualified professional natural science curator. In some instances a good case could be made for this, on the basis of providing a natural science service to the public and realising the full value of the collections.
2. Shared curatorial services. This may come down to a formal agreement between a group of museums to jointly employ a peripatetic curator.
3. Use of freelance workers.

4. Ad-hoc and informal use of curators from neighbouring institutions.
5. Programs of voluntary work. These would have to be very well prepared before work began to ensure that useful results were gained from the effort.
6. Transfer of Collections. This is an option that the registration scheme considers, when this represents the best interests of the collection.

#### Reasons for a national initiative

1. Greater weight. A 'single' scheme is more likely to gain the support of a wider range of backers, such as MGC, MA, AMC's, CRU's, specialist groups and institutions, as well as being more likely to gain the attention of central government.
2. It acts as a focus for raising the profile and improving the image of the profession.
3. It avoids the splitting of support for initiatives.
4. It has greater marketing potential. Given a name, a logo, objectives, an action plan, etc, it is more likely to attract sponsorship.
5. The network would act as an information gathering and distribution network, perhaps supported by newsletter, and provide a database for marketing and research purposes. Small or remote institutions would find such support particularly helpful.
6. A common scheme would enable the use of national standards and promote consistency of results.

#### Summary

It is clear that a substantial proportion of our heritage of museum collections is currently in a state of abandonment. Because such collections have no specialist care, they are undervalued, under used and poorly appreciated.

Some of this material is of international importance and much is of regional importance. The piecemeal efforts to protect individual collections, while very worthy, have not made a significant impact on the situation as a whole. If this material is to be protected, a concerted effort on the part of the museum community is needed.

A national scheme, on which individual collections managers will be encouraged to call for help, is likely to be the most effective way of dealing with the larger scale problem.

#### Recommendations

1. That a national scheme be designed that will bring about effective action on orphan collections.

2. That a new working party be set up, suitable for bringing this about and putting it into action.

#### References and further reading

- ANON. 1987. *Biological Collections, U.K.* Museums Association.
- ANON. 1988. *Guidelines for a Registration Scheme for Museums in the United Kingdom, Phase 1.* Museums & Galleries Commission.
- ANON. 1994. *SPECTRUM: A standard for museum documentation.* Museums Documentation Association.
- ANON. 1995. *Guidelines for a Registration Scheme for Museums in the United Kingdom, Phase 2.* Museums & Galleries Commission.
- ANON. 1997. *Code of Conduct for People Who Work in Museums.* Museums Association.
- ANON. 1997. *Code of Practice for Museum Governing Bodies.* Museums Association.
- ANON. in press. *Skeletons in the Cupboard: The report of the North West Collections Research Unit.* North West Museums Service. [All the regions have produced a register of natural science collections within the region but these have rarely contained more than a passing reference to the state of the collections, although the information was recorded in the surveys of the collections.]
- BRUNTON, C.H.C., BESTERMAN, T.P. and COOPER, J.A. 1985. Guidelines for the curation of Geological Collections. *Geological Society Miscellaneous Paper 17.*
- DOUGHTY, P. 1981. *The State and Status of Geological Collections in the UK.* Geological Society of London.
- KNELL, S.J., TAYLOR, M.A. and RODEN, R. 1987. *Geology and the Area Museum Service.* Area Museum Service for South East England.
- NUDDS J.R. and PETTITT, C. 1996. *The Value and Valuation of Natural Science Collections.* Geological Society.
- PAINE, C. (ed.) 1992. *Guidelines in the Museum Care of Biological Collections.* Museums & Galleries Commission.
- PAINE, C. (ed.) 1993. *Guidelines in the Museum Care of Geological Collections.* Museums & Galleries Commission.
- SIMMONS, M. 1993. *Discovering Green Treasures.* North of England Museums Service.
- TIMBERLAKE, S. 1987. *A preliminary report of the Travelling Geology Curator.* Area Museum Service for South East England.
- TIMBERLAKE, S. 1989. *The interim report of the Travelling Geology Curator.* Area Museum Service for South East England.

## LOST & FOUND

---

Enquiries and information, please to Patrick Wyse Jackson (Department of Geology, Trinity College, Dublin 2, Ireland; e-mail: wysjcknp@tcd.ie). Include full personal and institutional names and addresses, full biographical details of publications mentioned, and credits for any illustrations submitted.

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

### Abbreviations:

CLEEVELY - Cleevely, R.J. 1983. *World palaeontological collections*. British Museum (Natural History) and Mansell Publishing Company, London.

GCG - *Newsletter of the Geological Curators' Group*, continued as *The Geological Curator*.

LF - 'Lost and Found' reference number in GCG.

---

### 238. Bright, a Wenlock Limestone locality.

See also GCG 6(5): 208.

Matthew Parkes (c/o Department of Geology, Trinity College, Dublin 2, Ireland) writes:

In GCG 6(5): 208, information on a Silurian locality called Bright was requested.

Mr Gerald Lucy, of 7 Barnards Court, Church Street, Saffron Walden, Essex, CB10 1JS kindly responded with notification of a parish called Bright, about 7.5km SSE of Downpatrick in Co. Down, Northern Ireland.

Michael Simms (Ulster Museum) kindly checked the original six inch fieldsheets for the area. Although no fossils are recorded, nor any mention made in the memoir to the area, it seems quite likely to be the right place as the lithology and age are in agreement.

Mike Bassett, Keeper of Geology, National Museum of Wales, Cardiff, CF1 3NP, Wales, also responded with the possibility that the Bright on a lingulid specimen label referred not to the locality, but to the collector. This may have been Benjamin Heywood Bright (1787-1843) who collected fossils used by Murchison in his *Silurian System*, but whose collections have not been traced. However, Steve Tunnicliff (British Geological Survey) has now examined the specimen label and thinks this unlikely. Thanks to all for their assistance, with an interesting, if trivial, query.

### 245. Fossil Fish from the Lower Carboniferous of Armagh, Ireland.

Mags Duncan (Department of Geology, Trinity College, Dublin 2, Ireland [e-mail: mduncan@tcd.ie]) would be interested to know of museums and institutions holding Lower Carboniferous fish material from Armagh, and for any information on Admiral Jones, who presented

specimens to the Geological Society of London between 1841 and 1852 (CLEEVELY).

In the last century many Lower Carboniferous fish teeth were collected from Armagh and most ended up in the collections of the Earl of Enniskillen, Philip Egerton, and Admiral Jones. Frederick M'Coy described several species in 1848 (*Annals and Magazine of Natural History* (Series 2) 2) based on the collections, among others, of Admiral Jones.

J.W. Davis described and revised many species in his 1883 monograph on Carboniferous fishes of Great Britain (*Scientific Proceedings of the Royal Dublin Society* 1 (Series 2)(pt.25): 327-548) and utilised material in the collections of the Earl of Enniskillen, the Geological Society of London, and the Sedgwick Museum.

### 246. Plants, invertebrates and fishes from the Devonian/Lower Carboniferous of Kiltorcan, Co. Kilkenny, Ireland.

Patrick Wyse Jackson (address above) and Matthew Parkes (c/o Trinity College, Dublin) write:

In the middle of the last century James Flanagan, fossil collector of the Geological Survey of Ireland, discovered abundant fossil plants, fish and invertebrates at Kiltorcan, Co. Kilkenny. The yellow-green chloritic sandstones yielded many plants including *Archaeopteris hibernica* and *Cyclostigma* sp., fishes (*Groenlandaspis* sp.), eurypterids and the large freshwater mussel *Archanodon*. Considerable amount of material for research was collected in the nineteenth century, and as recently as the late 1960s.

Today much Kiltorcan material is in the collections of the Geological Museum, Trinity College, Dublin; the National Museum of Ireland; the Geological Survey of

Ireland; the Natural History Museum, London; and the Hunterian Museum in Glasgow.

For many years the flora and fauna was considered to be youngest Devonian, but recent work by Edward Jarvis (of University College, Cork) has shown that the succession spans into the Lower Carboniferous.

Together with Jarvis we are putting together a Fact File on the above topic for publication in a forthcoming issue of *The Geological Curator*, and are curious to know of those museums and institutions who have holdings of material from this famous locality.

## BOOK REVIEWS

Taylor, P.D. (editor). 1996. *Field Geology of the British Jurassic*. Geological Society Publishing House, Bath, U.K., 286 pp., over 176 illus. ISBN 1-897799-41-1. Paperback. Price: £65-00 (members of the Geological Society £29-00).

Re-reading the first geological "field" Guide in English (Conybeare and Phillips' 1822 *Outlines of the Geology of England and Wales*, printed with "small type and on thin paper" 195 x 120mm) reminded me that this book (275 x 210mm) is not designed to be taken in the field, despite its title. But in all other respects it is to be warmly recommended.

A short Introduction (by John Cope), in which I was sorry to see palaeogeographic use being made of "hermatypic corals in the Skye Hettangian", is followed by seven impressive chapters.

- 1) by G. Warrington and H.C. Ivimey-Cook on the Late Triassic and Early Jurassic rocks of the Bristol Channel area,
- 2) by D.C. Mudge on the Middle Jurassic of the Cotswolds,
- 3) by J.H. Callomon and J.C.W. Cope on the Jurassic of Dorset,
- 4) by Messrs S.P. Hesselbo and H.C. Jenkyns and
- 5) by A.L. Coe are two chapters coyly labelled "comparisons", of the Hettangian to Bajocian between Dorset and Yorkshire and the Oxfordian between Dorset, Oxfordshire and Yorkshire. A flavour of these chapters comes from the cover photograph, of Saltwick Nab's fine "Toarcian black shales...", the local expression of a global carbon burial event". The final two chapters
- 6) by P.F. Rawson and J.K. Wright are on the Jurassic of the Cleveland Basin and
- 7) by N. Morton and J.D. Hudson on the Isles of Raasay and Skye.

All chapters are full of new information and provide a vital and up-to-date source for all those in and out of museums who are involved in any way with Jurassic rocks. New information is particularly to be found in chapters 1 (summarising recent BGS work), 3 (presenting new results on Aalenian & Bajocian and the Jurassic/Cretaceous boundary rocks) and 7 (descriptions of more isolated Scottish Jurassic exposures). I was glad to see a photograph of the lectotype of *Psiloceras planorbis*, a species now agreed to mark the Triassic/Jurassic boundary and provide a "firm base for correlation", and to agree that S.S. Buckman's 1893 paper is "one of the most important stratigraphical papers ever written".

I was saddened by the dedication of chapter 2 to Derek Ager. How much his energy is missed in these over-bureaucratized days. I was also sad to find the Rugitela beds no longer equated with the Wattonensis beds. I have specifically argued against this myopia (*A Correlation of Jurassic Rocks in the British Isles* part 2, 27-28, 1980). The two "Comparison" chapters are based on "wider study of Mesozoic Sequence Stratigraphy" (handsomely funded by BP). I am frightened by many of the claims now made for what Sequence Stratigraphy can achieve. The 1992 paper by A.D. Miall, ("Exxon global cycle chart: An event for every occasion?", *Geology*, 20, 787-790) showed that one could then achieve an at least 77% correlation with the Exxon chart, but by just using random numbers! So I feel we have more to learn on these topics.

The volume is indexed for places and stratigraphic units but not for people. The diagrams and figures are beautifully done and the volume nearly clear of typographic blunders. One phantom reference (by me!) fails to appear in the references. Such loss of citation, for those bureaucrats, in no way detracts from the real value of this book. As for its price I am not sure. But start saving up for it now or join the Geological Society.

H.S. Torrens, Lower Mill Cottage, Furnace Lane, Madeley, Crewe CW3 9EU, U.K.

Spamer, E.E., Daeschler, E. and Vostreys-Shapiro, L.G. 1995. *A study of the fossil vertebrate types in The Academy of Natural Sciences of Philadelphia*. Academy of Natural Sciences of Philadelphia, Special Publication 16, 434pp. Paperback. Price: \$38-00.

The Academy of Natural Sciences of Philadelphia holds some of the most historic vertebrate types from North America. The collections include Thomas Jefferson's ground sloth *Megalonyx*, described in 1799, the first North American dinosaur, *Hadrosaurus foulkii* Leidy and Edward Cope's collection of Miocene cetaceans. The Academy's holding of types is relatively modest numerically, 400 original taxa and 40 casts; nonetheless, I do not know of any type catalogue more exhaustive in its treatment than this one.

The work is divided into three parts together with a full bibliography and list of holdings by register number. The first part is an introduction to the Academy, the history of its acquisitions and their conservation and cataloguing, including illustrations of labels types from the 1850s onwards. Part two is the type specimen catalogue, preceded by explanations of the format, the categories used in the entries, tables of numbers of taxa by systematic group, species lists by author, by collector and/or donor; by stratigraphical horizon and, finally, systematically by class, order and family. The basic unit of data, the binominal name, is therefore retrievable under a comprehensive set of headings.

The catalogue itself comprises separate sections for each class except for the mammals, divided quaintly into "Mammalia of terrestrial habitat (excluding Cetacea)" and "Mammalia of marine habitat (Cetacea)". Entries are alphabetical by species and include every single detail of the specimens - damage, repairs, colour changes due to handling, conservation measures, label contents, figure references, taxonomic history, and notes from visiting workers quoted in full. The level and detail of documentation serves as an example of the standard to which all type and figured catalogues should aspire. However, the entries could have been so much more useful if a cross-reference to order and family were included. Better still, in this reviewer's opinion, would have been listings in systematic order. For example, all the entries concerning *Megalonyx* would then have been grouped under one heading instead of the user having to juggle the index at the back and the systematic list to access the data for species belonging to that genus, a process I found quite irritating.

The third part of this work is a series of case studies in which the authors describe some of the complexities they encountered with the interpretation of the chequered taxonomic history of old, inadequately described material. Examples of almost every priority, type status, synonymy and date of publication problem are worked through using examples from the catalogue, discussed in relation to the International Code of Zoological Nomenclature. This is an enormously useful addition to the compendium of information and is an excellent working tool for anyone wrestling with similar problems.

In summary, an essential and totally comprehensive reference to one of the most important historical fossil vertebrate collections in the USA, with added value as a guide to taxonomic problems and their resolution.

Dr Angela Milner, Department of Palaeontology, The Natural History Museum, Cromwell Road, London SW7 5BD, U.K. 24th February 1997.

Harper, D.A.T. (ed.) 1996. *An Irish Geological Time Capsule - The James Mitchell Museum University College, Galway*. 67pp. James Mitchell Museum, Galway. ISBN 0 9529571 0 8. Softback. Price: £5-50. [Available from the James Mitchell Museum, University College, Galway, Ireland]

This book at first appeared to me to be a strange hybrid of articles, until I answered my own question, which was who is it written for? The seven chapters cover disparate aspects of the James Mitchell Museum, some with repetition of small sections of other chapters, but it all stitches together to make a book on the Museum that almost literally contains something for everyone. However, it is not primarily written or aimed at geologists, or even museum curators, but at a far wider audience, the greater public at large.

David Harper has succeeded in melding the different contributions to a coherent overview of both the past history of the museum, the recent restoration programme and the place of that museum in the local community and to a degree in the wider scientific community. The level of explanation and lack of jargon in some chapters, such as number 3, the fossil collections and number 5, the computerised database may be too simple for the specialist palaeontologist or computer buff, but they explain things comprehensibly for a casual reader.

That the museum has survived virtually intact is surprising, and some reasons for it are given in the book. The work involved and contributions of the FÁS Community Response Team and the National Heritage Council in the restoration of the Museum are documented and acknowledged in chapter 1. Other chapters such as that on the rock and mineral collections (Chapter 4) are excellent concise summaries of geological classification for the non geologist, whilst also highlighting the strengths of the collections, in particular the specimens of the fascinating geology of the west of Ireland.

The book is well supplied with illustrations and diagrams in black and white and in three colour plates, although one or two specimens ended up as rather garish colours in the final printing. The front cover is an excellent shot of the simple grandeur of the southeast corner of the Main Quadrangle of University College Galway, containing the extant James Mitchell Museum.

The final chapter is a very interesting discourse by Timothy Collins on the place of the museum in the local Galway community and on the wider historical context of museums in Society. This modestly priced publication should go a long way towards putting the James Mitchell Museum firmly back on Galway's map. It quietly raises a flag, both for wider public access to anyone interested in geology and to the College authorities for a secure future as a focus not an afterthought. Although in my judgement, it is aimed primarily at the general public, the book contains much of interest for any curator or geological historian.

Matthew Parkes, *Geological Survey of Ireland, Beggars Bush, Haddington Road, Dublin 4, Ireland. 7th December 1996.*

Collins, C. (ed.) 1994. *The care and conservation of palaeontological material*. Butterworth-Heinemann, Oxford, U.K., xi+139 pp. ISBN 0 7506 1742 X. Hardback. Price: £50-00.

This slim 139 page volume will be welcomed by geological curators and palaeontologists alike. The need for conservation when dealing with palaeontological material, as we are told in the Preface, has only recently been recognised, and is still ignored by many researchers and curators through whose hands such material passes. Why is this so? The reawakening in interest since the 1970s in our museological and cultural heritage was matched with reassessment of collections which demonstrated that many had

become degraded and frequently stored in less than adequate conditions. Palaeontologists generally pass research material on to institutions and museums and then wash their hands of conservational and curatorial responsibility, while curators often feel they can do little about improving collection care because of lack of information about curatorial and conservation techniques and/or the lack of funding to carry out effective conservation.

In recent years a number of publications have addressed the conservation issue as well as provide information about curatorial methods (Brunton *et al.* 1985, Child 1994, Crowther and Collins, 1987). *The care and conservation of palaeontological material*, together with its companion volume (Howie, F.M. (ed.) 1992. *The care and conservation of geological material* [see review in *The Geological Curator* 6(1): 30-31] provide in depth an outline of the problems that affect geological and fossil material and give some answers and solutions as to how they can be tackled.

The book contains thirteen chapters, all of which contain valuable information:

1. Development of treatments (F.M. Howie)
2. Documentation of palaeontological material (C.H.C. Brunton)
3. Documentation in geological specimen conservation (C. Collins)
4. Microfossils (R.L. Hodgkinson)
5. Conservation and care of palaeobotanical material (M. Collinson)
6. Aspects of conservation of fossil resins and lignitic material (F.M. Howie)
7. Stability of shale and other mudrocks (C. Collins)
8. Conservation of sub-fossil bone (S. Y. Shelton and J.S. Johnson)
9. Preservation of human mummified specimens (A.R. David and A.E. David)
10. Conservation and processing - cleaning and mechanical preparation (J. Wilson)
11. A review of the acid technique (W. Lindsay)
12. Conservation of SEM stubs and other mounting media (J. Golden)
13. Storage and transport (G.R. Fitzgerald)

Chris Collins has put together an attractive and essential book, with which I have just a few quibbles. The purchase cost is high, and may result in a smaller distribution than it deserves. The quality of some of the photographs, particularly in Chapter 3, is so poor as to make them useless and frustrating. Nevertheless, I applaud the authors of the chapters, and the editor, who managed to guide the book to full-term despite a long gestation period, for producing an important book that should be read and digested by all those who work with, and care for, palaeontological material.

BRUNTON, C.H.C., BESTERMAN, T.P. and COOPER, J.A. 1985. *Guidelines for the curation of geological materials*. *Geological Society Miscellaneous Paper* 17.

CHILD, R.E. 1994. *Conservation of Geological Collections*. Archetype Publications, London.

CROWTHER, P.R. and COLLINS, C.J. (eds). 1987. *The conservation of geological material*. *The Geological Curator* 4(7).

Patrick N. Wyse Jackson, *Department of Geology, Trinity College, Dublin 2, Ireland. 1st March 1997.*

**Bennett, M.R., Doyle, P., Larwood, J.G. and Prosser, C.D. (eds) 1996. *Geology on your Doorstep: the role of urban geology in earth heritage conservation*. Geological Society Publishing House, Bath, U.K., viii+270 pp. ISBN 1-897799-54-3. Paperback. Price: £38-00.**

Urban geology has, in recent years, become a subject of considerable interest amongst the geological community. The reasons for this are probably diverse, but much is owed to the championing efforts of Eric Robinson, whose two volumes on the building stones of London are 'milestones' in the subject. Today many geologists and some members of the general public have come to appreciate the geology of built and other environments as varied as the high street, cemeteries, parks, and in historic buildings.

This attractive volume was born out of a one-day meeting held at the University of Greenwich in January 1995. It contains twenty-four papers arranged neatly into four parts:

- Part 1. The rationale and scope of earth heritage conservation in urban areas. [4 papers].
- Part 2. The nature of the urban geological resource. [9 papers].
- Part 3. Awareness and use of the urban geological resource. [10 papers].
- Part 4. Creating an urban geological resource. [1 paper].

Matthew Bennett and Peter Doyle discuss the relationship between earth science conservation and urban geology and demonstrate that development of a wider appreciation of the latter can be highly beneficial to the former.

Geologists, museums, local government all have roles to play in promoting geology in the urban environment. 80% of Britain's population live in towns and cities and need to be made aware of the valuable resource in their midst. In so many cases 'development' is a misnomer for destruction, and old buildings, pavements, streets constructed of beautiful stone are swept away only to be replaced by functional, but boring concrete.

Can geologists and the museums community do anything to slow down this loss? Yes, indeed they can. Buy this book, read it, and then get out into the towns and cities and promote urban geology amongst the local population. Organise stone trails, walks, cemetery and church visits, and exhibitions in your local museum. This book gives many examples of how this can be done (for example Eric Robinson's 'Wall Game' and Roger Mason's paper on 'kerbstone petrology').

The urban geology resource needs to be recognised, and promoted as a valuable educational asset. It should be highlighted as being the underlying basis of the character of many of our towns and cities. These often owe their nature to the use of particular stone types in their construction, and it would be criminal if they were all to become homogeneous through development.

*Patrick N. Wyse Jackson, Department of Geology, Trinity College, Dublin 2, Ireland. 14th April 1997.*

# GEOLOGICAL CURATORS' GROUP

## 22nd Annual General Meeting

**29th November 1995 at the Assembly Rooms, Ludlow.**

### 1. Apologies for absence

Received from Chris Collins, John Cooper, Tony Cross, Diana Hawkes, Mike Jones, Rosemary Roden, Mick Stanley, Don Steward, and Patrick Wyse Jackson.

### 2. Minutes of the 21st Annual General Meeting 1994

The minutes were approved as a true record of the meeting. They were approved on the "general aye" and signed by the Chairman.

### 3. Matters arising

There were none.

### 4. Chairman's Report from Paul Ensom

During 1995, support for museums and collections has remained an important element of our work. We have been in correspondence with, or about, the following: Ipswich Museum, Museum of Isle of Wight Geology, Ludlow Museum, the Ulster Museum and the Smithsonian, the latter concerning the threat to the US Geological Survey and Bureau of Mines. We commented on 'Modern and Accelerated Apprenticeships in Museum and Gallery Heritage Sector' an independent report commissioned by the MTI, and the Museum Association's 'New ways to the AMA'. The latter was a joint response from the GCG and BCG and I am very grateful to Steve Thompson for the role he played in this. Committee was asked by the Ethics Committee of the Museums Association to produce the text for the code of conduct for the field collection of geological specimens. On behalf of the Group I was interviewed by Countrywise (acting for English Nature) on 'the promotion of earth heritage conservation'. We still await the outcome of the DNH review of its Museum Policy to which we submitted evidence last year; watch this space! We have just received *Draft English Nature Position Statement on fossil collecting: Invitation to comment*.

The need for the Group to be consulted and to respond is of considerable importance. I would like to make a plea on behalf of my successor that, if you are aware of reports in the public domain on which the Group should be commenting, please inform the Chairman or Secretary as soon as possible. The Group's effectiveness and reputation are dependent on our submitting responses of a high standard. These take time and ideally should be the result of the involvement of your Committee. You the members are GCG's ears and eyes and have a vital job to do if the important work of protecting our geological resources is to be effectively pursued.

Earlier this year Committee approved the investigation of an Internet entry for GCG. As is the way with IT, no sooner said than done, thanks to John Faithfull and Mandy Edwards and their respective institutions who were responsible for this high-tech link-up. Please recommend this slot to any you know who surf the Net.

Tom Sharpe has valiantly pursued the elusive goal of the new GCG display. He has negotiated a generous sponsorship deal with Haley Sharpe Associates, the design is complete and we now await construction. These new panels will replace our existing, quite aged, display with one which is up to date and versatile. Committee hope that the representation of the group and its activities will be even more readily travelled to Geological Society Careers days (where we were just last week), and other geological events, promoting the Group's aims and ideals.

The Group has had a full programme of seminar meetings during the year. Much work goes into the organisation of these at a variety of levels. I would like to thank all organisers, speakers and writers of reviews for their hard work. I would like to pay a special tribute to the organising committee of the Value and Valuation conference held in Manchester last April. Our Recorder and Chairman Designate, John Nudds, was on the organising committee and was the Conference Treasurer. As one of those who attended I can candidly report that the event was a great success and seems likely to colour much of the thinking of the museum community at many different levels. The abstracts for this were circulated to all our members through the good offices of Patrick Wyse Jackson. The *International Accord on the Value of Natural Science Collections* agreed at the end of the meeting was published in *Coprolite*, 17, pp. 15-16. The June seminar, *Down in the Dumps*, also produced resolutions which have since formed the basis of a wider discussion document and proposals for the future of the NSGSD. This will continue as a matter for discussion by Committee in 1996. As Chairman I have attended all but one of our programme of seminars over the last three years. I greatly regret that the attendance at the last two was disappointing. While appreciating the pressures of both time and finance on many, I do hope that for the well-being of the Group, and the profession as a whole, you will find the resources to attend from time to time. Perhaps the rather contentious matter of 'Continuous Professional Development' may provide suitable windows of opportunity?

Progress on the Building and Decorative Stones Initiative has been rather ponderous. However the last issue of *Coprolite* carried a questionnaire to which there was a dramatic but short-lived response. I hope many more will be returned as they certainly provide valuable data for the future development of the initiative, and in the short term could form the basis for a useful published listing of the basic

details of museum holdings.

At this meeting Colin Reid stands down as our Publicity Officer. I would like to pay tribute to Colin Reid's stalwart work on the *Thumbs Up* leaflet, a 3rd edition of which is imminent. Apart from the administrative aspects of updating the information (all the 'phone numbers have changed since the last printing) there has been the need for substantial fund-raising. The £3000.00 required has come from the sponsors of the last edition, namely British Gas Exploration and Production, The Geological Society, The Curry Fund of the Geologists' Association, Rockwatch and, in addition, the Natural History Museum. We are immensely grateful to all our sponsors who have enabled this important work of outreach to continue. Their support speaks volumes for the product and I hope you will ensure that the new edition is distributed as widely and as wisely as possible.

I would like to point out that in the course of the last three years we have received £7,500 in sponsorship for *Thumbs Up* and *Coprolite*. The latter continues to attract generous sponsorship from Clinton Burhouse (Burhouse Ltd) to whom we accord what at present is an annual vote of thanks for this significant support of one of the Group's activities.

I thank all those who have served on the Committee, not only in 1995, but over the last three years and for the tasks they have so readily tackled. They have been an outstanding team, dealing with the production of the *Geological Curator* and *Coprolite* (the membership list in the latter was no mean feat), matters financial and to do with membership, with seminars, administration and publicity for the Group. We have welcomed new faces bringing new expertise and ideas. I report with sadness that Simon Timberlake resigned both as a Committee member and as a member of the Group. Simon's contribution to the documentation of collections in south-east England has been outstanding. The Geologists' Association recognized his achievement in 1991 when he was awarded the Foulerton Medal, an event which went unmentioned in our own annals, and which belatedly I put right now. He was one of those 'silent warriors' in the cause of the neglected collection, an often thankless task, and yet one which is so close to the Group's aims. The profession has lost a champion of the orphan collection. We wish him well. Thanks also go to Monica Price for her work on *Coprolite*, to Roy Clements for chairing the Terminology Working Party, to Sue Rainton our archivist, to Kate Pontin for feeding us information on the education sector, John Cooper for representing us on the Conservation Committee of the Geological Society and to Mick Stanley who has continued to report on the NSGSD. He has given loyal service over more years than he cares to remember. There is a rumour which, if believed, would suggest that this will not be for much longer.

Committee has instigated a review of the Group's constitution. No major changes are envisaged but some minor amendments and improvements will be put forward which should make Committee and the Group more effective. Any changes will have to be approved by the Geological Society and Charity Commissioners, and of course our members as well. A

revised constitution will be circulated to all members and voted on at an appropriately advertised EGM (probably at a seminar meeting) in the course of 1996.

As 1995 draws to a close, I am pleased to report that the GCG continues as a vigorous and effective specialist group. Interest in the Group and its aims remains high, judging by the response shown by geological curators in Japan, and students and others attending the Geological Society Careers day.

In conclusion I thank the Group for all their support and interest while I have been Chairman, thanks I extend to the officers and staff of the Geological Society as well. You have made my three year term a most enjoyable one. The presentation, earlier today, of the A G Brighton Medal to Dr Bob King, has been an especially pleasant way to bring my Chairmanship to a close. Shortly I will have great pleasure in handing over to Dr John Nudds who comes with an excellent track-record, a wealth of experience and his proven ability at timekeeping in committee meetings! He will be a great asset to the Group over the next three years. I wish him, the Committee and the Group as a whole every success in the challenges which unquestionably lie ahead.

This report was approved on the "general aye".

## 5. Secretary's Report from Mandy Edwards

The Group held four meetings and one workshop this year. The first meeting of the year was the very successful meeting held at Manchester in April on the Value and Valuation of Natural History Collections arranged jointly with BCG and the Manchester Museum. John Nudds, our Recorder, was closely involved with this meeting and he will give a full account in his report. In June the Group met at Burlington House in London to discuss the future of the National Scheme for Site Documentation. A set of statements were agreed by those present which included a reaffirmation of the value of NSGSD and the valid role of the geological curator in the Scheme. In early October we held a two day meeting on the Isle of Wight on the theme of From the Field to Display, which looked at issues relating to the collection and curation of geological specimens with special reference to the Isle of Wight. The final meeting of the year was at Ludlow on the theme of *Geology for All*. An informal workshop was held at Manchester in July on advanced techniques in mineral identification, unfortunately the other two planned workshops were cancelled due to a lack of numbers. I should like to thank all of the local secretaries for their hard work in organising the meetings this year. The meetings this year have had quite small attendances which is a shame considering the amount of work people put into arranging them. The meetings themselves have been very interesting and the lack of people attending seminars is a problem that the committee must look at again. We have four meetings planned for 1996 and I hope we can convince more of the group to attend next year. They are a meeting in Newcastle in April on the future of training and how it can affect all of us. A meeting in June at Liverpool on new technologies and how small museums can take part in the information revolution that is happening at the moment. This meeting will also include the official launch of the

GCG's World Wide Web Pages. We are intending to hold a session at the Museums Association Annual Meeting in Harrogate in September which is on the theme of Collections. The final meeting of 1996 will be held at Manchester in December on Geological Models and their use in interpretation in the museum. I am always looking for suggestions for ideas for meetings and offers of places to hold them. Please contact any member of the Committee with your ideas.

The Committee have met three times this year. In January we met in London and in May and October at the Manchester Museum. There are two small working groups looking at Terminology and the GCG Constitution. The Terminology working group have several documents at a draft stage and so we should see the publication of their thoughts next year. The Constitution working group has only recently been formed to see what if anything in the constitution needs changing from the original.

The Geological Society have asked us for nominations for the various annual awards and prizes it hands out: I am keen that we respond to this request in order to publicise the work of geological curators. If anyone has any suggestions of people who should be nominated please get in touch with any of the members of committee.

Committee members - Paul Ensom has completed his term of office and I should like to take this opportunity to thank him for the friendly and efficient way he has handled GCG matters and made the job of Secretary so much easier. Gill Weightman, Simon Timberlake and John Faithfull all finish on Committee and my thanks to them for the work they have done in supporting the Secretary.

Roy Clements was asked to speak to the item concerning the Terminology Group. He reported that draft recommendations concerning four areas of Terminology will be available in the near future. Links with MDA and LASSI have been established to avoid duplication of effort.

This report was approved on the "general aye".

## **6. Treasurer's Report from Andrew Newman**

### **Financial report**

The Accounts for the period 30/11/94-29/11/95 are attached.

The Geological Curators' Group has total assets of £13014.43. As can be seen from the accounts the major expenditure during the year has been the production of *The Geological Curator* and *Coprolite*. We very grateful to our sponsors, British Gas, The Geological Society, The Geologists Association and The Royal Society for Nature Conservation, who have supported various projects. The increase in subscriptions has meant that the group has made a modest surplus for the year of £277.06. This is clearly a much more healthy situation than 1994 when expenditure exceeded income. However the situation will need to be closely monitored and it may be necessary to raise subscription next year. I would like to thank members who have paid their

subscriptions on time and remind those who have not paid for this year to send them to me as soon as possible.

## **Membership**

The totals are now

UK personal	280
UK institutions	94
Overseas Personal	65
Overseas Institutions	57
Complimentary	9
TOTAL	496

This represents a growth of 27 subscriptions during the year. The membership drive has provided many new members and there has been a number of resignations, mainly due to retirement.

This report was approved on the "general aye".

## **7. Editor's Report from Patrick Wyse Jackson**

Two issues of *The Geological Curator* were published in the year:

Volume 6, Part 3, pp. 114-146 - issued 27th March 1995

Volume 6, Part 4, pp. 147-184 - issued 15th September 1995

These contained 7 papers covering a wide range of topics (on London Clay nautiloids; collections managers; curation and conservation; Jamaican echinoids; Peterhead museums; micropalaeontological preparation and conservation; and the Vivian Collection in UCL). Paul Clasby contributed a note on resonant rocks while Nigel Monaghan supplied the 2nd Fact File on Irish Giant Deer. Nineteen books were reviewed.

This report was approved on the "general aye".

## **8. Recorder's Report from John Nudds**

The somewhat undefined role of the GCG Recorder, this year saw a complete change of tack in my work for the Group. With the *Directory of British Geological Museums* published and selling well, my efforts this year have been directed entirely towards the organisation of the first International Conference on the Value and Valuation of Natural Science Collections which was organised jointly with the BCG and The Manchester Museum, and held at The University of Manchester from 19th-21st April 1995.

This conference was a huge success, attracting almost 150 delegates from 30 countries, including Australia and New Zealand, Africa, North and South America and from almost every European country. During the three days, 36 papers were presented, with 10 poster presentations, organised into sessions on cultural value, scientific value and financial value, the latter including some fascinating talks by accountants, insurers and auction houses. A keynote address was given by Lord Cranbrook, Chairman of English Nature, while the final session took the form of an open debate, chaired by Peter Longman, then Director of the Museums and Galleries Commission.

The first result of the conference was the publication on 27th April of an International Accord which was circulated to all delegates, to UK museum bodies, to relevant Governments departments, press contacts and media, and has since been translated into several languages by delegates and presented to their respective governments.

The longer term result will be the publication of the proceedings of the Conference which is currently being edited by myself and Charles Pettitt of the BGC and Chairman of the Conference Organising Committee. This publication will include 45 papers and a reprint of the Accord and is well on the way towards publication. All but three of the manuscripts have been received and edited, and negotiations with a publishing house are well-advanced. We expect this publication to appear in the first half of 1996. Those conference delegates who registered by the stated deadline will receive a free copy of the Proceedings, other delegates will be offered copies at a reduced rate and all members of GCG will be informed via *Coprolite* as to how to order copies.

Roy Clements asked how successful had the sales of *The Directory* been. The Recorder stated that Mike Collins of the Geological Society Publishing House felt that sales were as good as could be expected and that a 2nd edition was a possibility.

This report was approved on the "general aye".

## **9. Publicity Officer's Report from Colin Reid**

*'Thumbs up' guide:* Much of the PRO's efforts this year were put into producing a re-print of this very successful publication. The last edition, brought out in Spring 1994 was restricted to 70,000 copies due to the impending British Telecom code changes. As expected, it proved very popular and supplies were quickly exhausted.

Thanks to the further generosity of all the previous sponsors (British Gas Exploration and Development (£1000); the Geological Society (£500); Geologists' Association Curry Fund (£500) and Rockwatch (£500), together with the Natural History Museum (£500), we have been able to both update the original guide and produce a larger print run of 150,000 leaflets. The guide is now at press and will be distributed to museums before Christmas.

*Display panels:* Tom Sharpe has been liaising with Haley Sharpe Associates (no relation!) on the production of promotional display panels. Shortage of time has hindered progress, but the text is written and photographic material collated. The panels should be completed by mid-1996.

Due to a heavy workload I am standing down as Publicity Officer for the Group. It has been a very rewarding position and I trust my successor will find it likewise.

This report was approved on the "general aye".

## **10. National Scheme for Geological Site Documentation Coordinator's Report.**

No report was submitted.

The Chairman stated that a meeting of the Ad-Hoc Steering Group was being called to discuss ways of funding a full-time project.

## **11. Election of Officers and committee**

The Chairman - Paul Ensom, said that he was sad to stand down. It had been a happy time which had flown by. He thanked all the members of the Committee and gave his best wishes to the future members.

As there were no nominations from the floor all new Officer and Committee posts were elected as given on the foot of the Agenda sheet.

## **12. Election of Auditors**

Ken Sedman and Peter Davies were nominated and approved on the "general aye".

## **13. Any other business**

There was no other business.

## **14. Date and venue of next AGM**

Wednesday 27th November 1996 at the University of Manchester.

Paul Ensom thanked Joun Hurst and the Shropshire Museum Service especially Kate and Colin; the speakers and staff of the Assembly Rooms.

The new Chairman John Nudds said that the Group owed an enormous dept of gratitude to Paul Ensom and referred to his unique and delightful charm and revitalisation of the Committee. He had overseen the production of *The Directory* and the rejuvenation of *The Geological Curator*. He encouraged a new look at the Constitution and had chaired the 21st Anniversary Meeting of the Group. While he was sure Paul would continue to fight our corner he wished him a long and happy retirement.

The Chairman then wished all the membership a Happy Christmas.

**Annual Accounts 1995 (30th November 1994 - 29th November 1995)**

	1995	1994
<b><i>Current Account Income</i></b>		
Subscriptions	5018.53	3651.78
Sale of backnumbers	-	112.75
Advertisements/Sponsorship	2570.00	2000.00
Meetings fees	115.00	524.00
Committee lunch	-	28.75
Transfer	700.00	3100.00
 Balance	 822.32	 978.68
	<u>9225.85</u>	<u>10395.96</u>

<b><i>Premier Interest Account Income</i></b>		
Interest	507.78	491.24
Balance	11915.05	14523.81
	<u>12422.83</u>	<u>15015.05</u>

<b><i>A.G. Brighton Funds in Premier Interest Account</i></b>		
Balance on 30/11/94	1519.33	
Income	21.32	
Engraving Costs	(10.72)	
Balance on 29/11/95	<u>1529.93</u>	

	1995	1994
<b><i>Current Account Expenditure</i></b>		
<b><i>Geological Curator</i></b>		
Printing	3909.09	2654.81
Postage	-	969.35
<b><i>Meetings</i></b>		
Committee	199.54	261.00
General	536.30	699.25
Univ Manc	-	250.00
Geol. Soc. Tea	-	59.98
MGC	-	59.00
<b><i>Coprolite</i></b>		
Print and distribute	2470.62	1804.91
<b><i>Brighton Medal</i></b>		
Engrave	10.72	-
<b><i>Thumbs Up Leaflet</i></b>		
Print	-	1480.00
Design	-	80.00
Post	-	284.00
Post	-	85.14
Courier	-	62.27
<b><i>Publicity Leaflet</i></b>		
Dist. Reingold	-	352.50
Dist. Geol. Soc.	-	293.75
<b><i>Leaflet</i></b>		
Design	299.63	-
<b><i>Other expenditure</i></b>		
Returned cheque	6.00	-
Archive	48.18	-
General	26.67	-
Postage	-	11.82
Computer Labels	-	20.15
HPL4 Toner Cartridge	-	97.53
<b><i>Biology Curator</i></b>	427.50	-
 Balance	 1291.60	 822.32
	<u>9225.85</u>	<u>10395.96</u>

<b><i>Premier Interest Account Expenditure</i></b>		
Transfer to current account	700.00	3100.00
Balance	11722.83	11915.05
	<u>12422.83</u>	<u>15015.05</u>
 <b>Total Income</b>	 8211.31	 6808.52
<b>Total Expenditure</b>	7934.25	9573.64
	<u>277.06</u>	<u>(2765.12)</u>

[signed] A. Newman *GCG Treasurer*

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

## PRESENTATION OF THE A.G. BRIGHTON MEDAL TO DR BOB KING



*The Geological Curator* 6(7): 287-289 [1997]

### Address by Paul Ensom, Chairman of the GCG at the GCG AGM Ludlow, 29th November 1995.

Without doubt, the most pleasurable aspect of my term of office as Chairman of the GCG is to present the Brighton Medal and I have enormous pleasure in welcoming Bob King, and his wife Sally, here today for that purpose.

However before the presentation, I would like to say something about both the Medal and the recipient.

The A.G. Brighton Medal (Figure 1a, b) was the inspiration of the late Dr David Price and is so called in memory and celebration of the life and work of Albert G Brighton, Curator of the Sedgwick Museum's geological collection between 1931 and 1968. During this time he curated some 375,000 specimens at the rate of over 10,000 a year - an example to us all.

The terms of reference state, ' It is intended that the Medal shall be awarded triennially to medallists chosen from those who have devoted a significant part of their working lives to the actual care of geological specimens or who, through their example or by teaching (including writing), have inspired others to the better care of geological collections, eg, through collections research.'

Having set the scene, let me turn my attention to Bob King.

His name is well known to a great many people, not least through his long association with the GCG, of which he was made an Honorary Member in 1989. Many will know him personally, to others he will be the name behind the series 'Minerals Explained' in *Geology Today* amongst many other publications.

In 1939 Bob began his museum career when he joined the staff of the Leicester Museums as a student assistant, a career which as for many was cut short by the outbreak of the 2nd World War.

After the War he followed new avenues - perhaps *pastures new* would be more appropriate since it was agriculture into which he ventured. We can only speculate at the opportunities for mineralogy - but I daresay that when holes were dug they were well scrutinised, and perhaps obscure minerals such as phosphates and nitrates produced by the reactions of agrochemicals or the by-products of stock may have caught his well trained eye.

Clearly this was not enough, for in 1954 he joined the technical staff of the Department of Geology at what was to become the University of Leicester. His

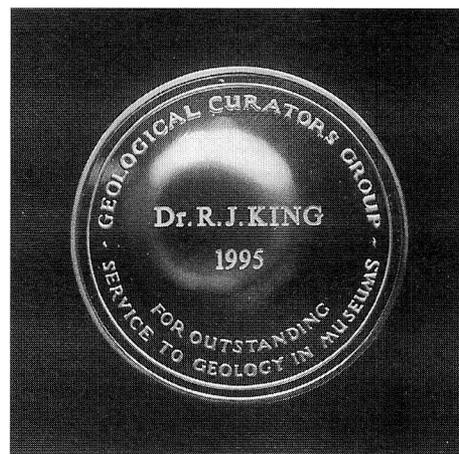
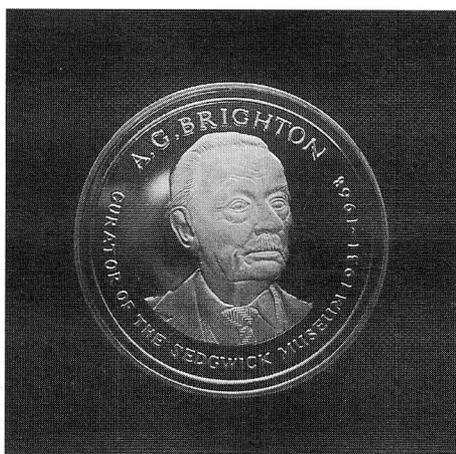


Figure 1.  
The A.G. Brighton Medal.  
(1a. (l): obverse; 1b. (r): reverse)

involvement in the Department doubtless provided increased opportunities for the pursuit of his life-long interest in mineralogy. In 1963 he was appointed full-time Curator within the Department, a new post in which he thrived. The Department's geological collections had lavished on them a level of care which should have made other departments green with envy.

His lifelong interest had become directed towards a major research project which in 1973 led to him being awarded a PhD on '*The Mineralogy of Leicestershire*'. This topographic mineralogy was a remarkable, indeed unique, piece of research. I am not certain whether it was in the course of that research or later that he narrowly escaped serious injury in a mine accident - which I seem to recall involved explosives! Fortunately for the profession he survived.

The early seventies were a hectic time for Bob with involvement in many different organisations. One of these, the Leicester Literary and Philosophical Society elected him Life President of Section C (Geology) in 1971 in recognition of his considerable services to the geology of Leicestershire. Synchronously his infectious enthusiasm for mineralogy and geology was a significant catalyst in the formation of the Russell Society. In 1973 he was elected their first President and recently was awarded the first Russell Medal. In this context, as in many others, his own high standards of curation and display were an example to all who came into contact with them.

Not only did Bob lead by example! Undergraduate students in the Leicester Geology Department were expected to present curated collections of specimens illustrating and supporting undergraduate mapping theses. This emphasised to the students the importance of the selection, documentation, presentation and care of specimens. In this context no student left Leicester with any doubt as to what constituted an adequate hand-specimen!

Bob became involved in the post-graduate course in Museum Studies at Leicester. Between 1966 and 1983 he trained a total of 32 students, myself included. I am delighted that at least some of them are here today. His own wide interests rubbed off on and inspired many of us, and the profession as a whole owes a great debt to him for his knowledge and expertise so freely shared. His high standards of curation from the moment of collection, through specimen numbering (a method of photographic reduction of specimen numbers to aesthetically pleasing and appropriate sizes was developed by Bob), recording and indexing, to conservation and the long term care of collections were all high on his teaching agenda. A colleague has called his approach 'Hollistic', where specimens were not just

minerals, rocks or fossils, but part of a complete picture which had many applications. One such is in site conservation in which Bob has also had a keen interest. How essential that we strive to maintain his standards and vision in these volatile times.

In 1974 Bob (and his office) played a significant role in the formation of the Geological Curators' Group which last year celebrated 21 years. He was in no doubt about the role which the GCG would play, not a universally shared view at the time. A key feature in the development of the Group was the recognition of the role of the peripatetic geological curator, a field in which Bob was as much involved then as he has been in recent years.

Since 1959 he has steadily published singly and jointly authored papers mostly concerned with aspects of mineralogy. Amongst these are a number which are especially relevant to our own Group and its aims. Examples are a chapter entitled 'Building a Collection' in *The Illustrated Encyclopedia of Minerals* (1978), Catalogues of the Cassiterite and Fluorite specimens in the R.J. King Collection, and 'The Care of Minerals' parts 1 and 2 in the *Journal of the Russell Society*. In addition there is the ongoing series on minerals in *Geology Today*. I cannot resist noting here that not everything Bob has published has been to do with minerals - 'Choirs and the Weather' in the *Musical Times* in 1962 highlights another of his interests.

At Leicester Bob had been promoted to Senior Curator in 1979, a post which was retitled Principal Curator in 1980.

In 1983 Bob left Leicester to join the Geology Department of the National Museum of Wales. This same institution received his fine and superbly curated collection of minerals.

Bob left Cardiff in 1988 and became Curator at the John Moore Countryside Museum at Tewkesbury where his industry led to the award of the Gulbenkian Museum and Galleries Award (1990) for 'The most outstanding improvement achieved with limited resources'. He is now rather misleadingly titled 'retired'; I don't believe it!

In my opening remarks I listed the attributes for which the Medal might be given. All of these Bob has contributed to significantly. Bob, you are a Founder Member of the Group; you were made an Honorary Member in 1989. The fruits of your deep and very professional commitment to geology have permeated much of the geological profession. The award of the A.G. Brighton Medal in 1995 is an entirely appropriate tribute to a life dedicated to the field of Geology, and it is with great pleasure I ask you to accept this prestigious Medal as a mark of the Group's respect and gratitude.

## **Response by Bob King.**

Mr Chairman and Friends of the Geological Curators' Group, please accept my grateful thanks for the great honour you have bestowed on me in the award of the A.G. Brighton Medal.

I was fortunate enough to meet Bertie at the Sedgwick Museum in the 1960s where I had been sent by the late Professor Sylvester-Bradley for a few days tuition under the great man. I learnt much there, not least how not to do things curatorial. It was a valuable exercise.

This award, this accolade, is really the climax of a long period of reward in watching my many students become friends and, at the same time become complete geological curators in demanding and responsible jobs - an award which will continue for the rest of my life.

One of the best things to happen to me during my career in geology was to be invited onto the selection board for prospective students to take the geology option in the Department of Museum Studies in Leicester. I firmly believe that curators are born not made, and it was a great privilege to be able to identify them. You are here before me now.

It is a long while since the conception of the Group, but it has been a pleasure to watch its development brought about largely by the dedication of its members to the original ideals. I congratulate you.

Once again I thank you for thinking of me as you have done today.

# 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.

If submitting articles on disk please note the following:

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

## Regular features

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

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

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

**CONSERVATION FORUM** helps keep you up to date with developments in specimen conservation. Information on techniques, publications, courses, conferences etc. to Christopher Collins, Sedgwick Museum, Department of Earth Sciences, University of Cambridge, Downing Street, Cambridge CB2 3EQ (tel. 0223 62522)

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

**INFORMATION SERIES ON GEOLOGICAL COLLECTION LABELS** consists of loose A4 size sheets, issued irregularly, which carry reproductions of specimen labels usually written by a collector of historic importance. The aim of the series is to aid recognition of specimens originating from historically important collections. Contact Ron Cleevely, Department of Palaeontology, The Natural History Museum, Cromwell Road, London SW7 5BD.

## Advertisement charges

Full A4 page	£60 per issue
Half A4 page	£40 per issue
Quarter A4 page	£25 per issue

Discounts for space bought in three or more issues. Further details from the Editor.

Inserts such as publishers' 'flyers' can be mailed with issues of *The Geological Curator* for a fee of £60. 550 copies of any insert should be sent to the Editor.

## Subscription charges

UK Personal Membership	£10 per year
Overseas Personal Membership	£12 per year
UK Institutional Membership	£13 per year
Overseas Institutional Membership	£15 per year

All enquiries to the Treasurer/Membership Secretary, Andrew Newman, Department of Archaeology, University of Newcastle, Newcastle-upon-Tyne NE2 4PT (tel. 191 2227419; fax. 191 2611182; e-mail: andrew.newman@ncl.ac.uk).

## Backnumbers

Backnumbers of *The Geological Curator* (and its predecessor, the *Newsletter of the Geological Curators' Group*) are available at £2.50 each (£5.25 for the double issues of Vol. 2, Nos. 9/10 and Vol. 3, Nos. 2/3; £7.50 for Vol. 4, No.7 Conference Proceedings) including postage. Orders should include payment and be sent to the Treasurer (address above).