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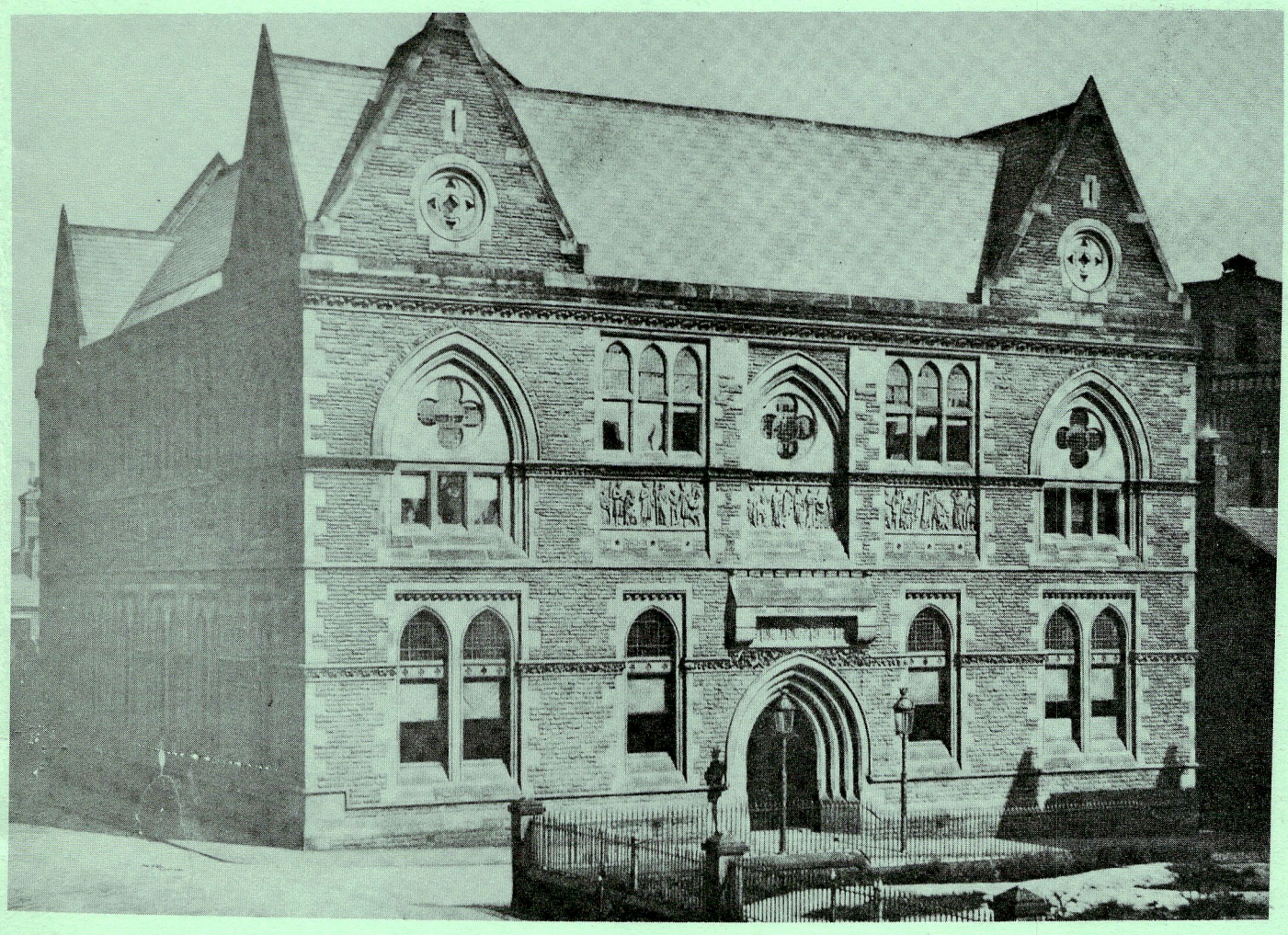

BLACKBURN MUSEUM

FRONT COVER

Blackburn Museum. This building was opened in June, 1874. This photograph was taken several years after the opening before the School Board Offices were erected opposite. The three panels of sculpture on the West front show 'Art', 'Literature' and 'Science'.

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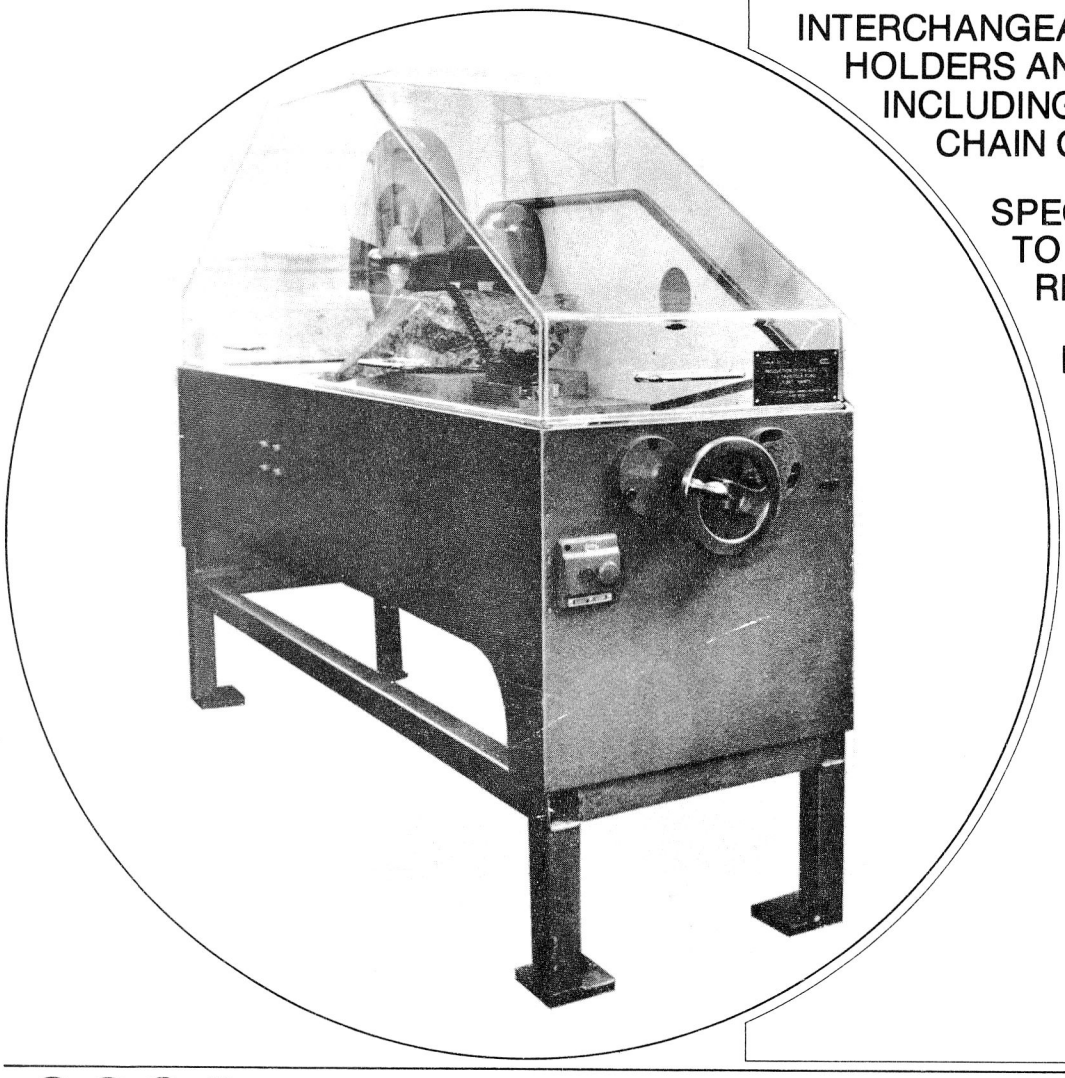

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GEOLOGICAL CURATORS GROUP

(AFFILIATED TO THE GEOLOGICAL SOCIETY OF LONDON)

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COLLECTIONS INFORMATION TO - Dr. Hugh S. Torrens. (Chairman)

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A COLLECTION FOUND!

The tragic end? - or a new start for the ffarington collection (49).
See p. 127.

COLLOQUIUM ON CURATING IN PALAEONTOLOGY - A PERSONAL VIEW

This international workshop/colloquium was held jointly by the GCG and Palaeontological Association at The National Museum of Wales, Cardiff from 29th March to 1st April 1978. It was attended by a unique mixture of working museum geologists at all levels together with academic and research palaeontologists. The contributions to this meeting were 30 in number and clearly this is too many to be individually reviewed here. The full proceedings will be published elsewhere, hopefully as a Palaeontological Association Special Paper. The purpose of this short account therefore is to highlight some of the major issues which made themselves apparent not only as a result of the programme (for which the organisers are to be congratulated) but also due to the lively discussions which ensued. I should emphasise that my comments do not necessarily indicate the mean of any argument which developed but reflect only my own views and interpretations.

Although any group of individuals with a cause are most able to provide their own raison d'être, the "unique role of the curator in palaeobiology" could not have been better argued than by Charles Waterston. Professional curators are possibly an insecure lot but anyone who convinces me that museum geologists have a part to play in the punctuated equilibria v gradualism debate, in addition to "TRUTH"-seeking has my support. This kind of job description should be read by all budding palaeontologists before any other. Unfortunately, the majority of museum employers will not agree but until they are able to understand at least some of the rationale advanced by Charles Waterston, museums will continue to abuse their geologists and geological collections. The "authority of the specimen" (or The Specimen Rules O.K!) should be our rule of thumb. "The curator must recognise his task and position: Palaeontology must recognise his value".

Ian Rolfe followed this later in the morning with a session devoted to particular responsibility collecting. He laid emphasis on the value of formally stated collecting policies, of which, only one (Leicestershire Museums) has been published to date. The potential roles of the Museums Association Code of Practice, the ICOM and UNESCO conventions were stressed and their adoption strongly advocated. The disappointing lack of immediate response to this discussion betrayed the apparent inability of the audience to appreciate the worth of this contribution and its message. Thankfully, the theme repeatedly appeared throughout the colloquium as its importance was gradually recognised and hopefully this will result in some progress being made towards the goals of the meeting as a whole.

The roles of various institutions in palaeobiological curation were examined and discussed by Dr. H. Ball, Dr. A. W. A. Rushton, Dr. I. Strachan and Dr. M. G. Bassett. Dr. Ball's contribution on the evolution of the collection of the BM(NH) was, as far as I am aware a unique account, concentrating purely on the Department of Palaeontology. I look forward to seeing this in print. Mike Bassett usefully raised a number of points for discussion from this session, namely that: certain themes and problems repeatedly arise in all types of museums with regard to the care of the palaeobiological collections; only the best curators attend meetings - the worst carry on regardless; the ICZN recommendations place certain responsibilities on institutions; societies have a valuable role to play both in their own work and as pressure groups; publishers should refuse research papers based on badly curated collections or with inadequate citations. The development of solutions to the problems outlined in this session could again provide a major step forward. Passing over the lucid and interesting technical contributions of Dr. A. W. Gentry (curating fossil vertebrates), Dr. C. Scrutton (thin section identification of corals and its implications) and Frank Howie (museum environments and fossil conservation) brings me to the session on type specimens.

Twice now (in Cardiff and Liverpool) I have awaited with keen interest the great debate on the question of type specimens and their location. Twice it a has not materialised. One could be forgiven for thinking that the topic is a red herring (type specimen unknown) and that a problem does not in reality exist. In my mind it does, and museum geologists need a rationalised and clear policy advocated and agreed by all concerned so that it can be implemented nationwide. Where should they be kept? How should they be stored? Should they be cast/sectioned/displayed/posted/loaned etc? Every museum geologist has his or her own view but if we carry on in this unstructured fashion no answers will ever be forthcoming. I do not wish to be spoon-fed but merely advised by a common consensus reflecting a professional outlook. Perhaps on this occasion the unfortunate absence of Peter Morgan contributed to the lack of progress. I hope that some lessons were learnt from Dr. David Bruton who described the enviable situation in Norway regarding the storage of type specimens. Although a historical perspective allows us to ruminate on the lack of a coherent policy in Great Britain, it was salutory to see so much common sense being applied elsewhere.

The session on collection management and data in palaeobiology understandably centred on the use of computers in various institutions at home and abroad. Interesting and stimulating contributions were presented by Richard Light (MDA), Dr. Howard Brunton (BM (NH)), Sue Turner (Hancock Museum) and Dr. B. Jones (University of Alberta). There is an irrational element to any discussion on computer technology as applied to museum collections. It seems that many people just cannot get used to the idea, whether they admit it or not. Generally I think most delegates to this meeting recognised the benefits of electronic data processing particularly in view of the evidence presented. Howard Brunton however spotlighted the real issue by concluding that his pilot project using the GOS package from the MDA on a brachiopod collection was unjustified in terms of man-hours of effort. Whilst the use of computers from the initiation of any documentation work is relatively easy and cheap, the conversion of large amounts of unstructured information to data capable of being handled by machine is difficult and expensive. Unless backed by more than adequate funds and resources, computerisation in traditional museums is not, in my view justifiable. What we should concern ourselves with is quality of information in a manual system, such that future computerisation would be relatively simple and not bedevilled by consequent re-curation. Contributions related to problems of data handling other than by computers were admirably provided by Dr. Natasha Heintz (University of Oslo) and Dr. D. Worsley (University of Oslo).

The session entitled "the curator and palaeobiological displays" was generally disappointing though a highlight was the paper presented by Dr. R. Miles (BM (NH)). In this he emphasised the importance of display by objectives in order to achieve a high degree of exhibit effectiveness and carried out a reasoned criticism of work done in the USA by behavioural psychologists as applied to display. Much of this work unfortunately could not be applied to conventional museum exhibits. He concentrated on the evaluation of effectiveness of displays, both at the planning stage and beyond. The message of this paper may not have been very clear to some members of the audience, assuming that many had never been involved with display work. The relatively late emergence of these ideas in this country has met with little comment and apparently no recognition of their radical nature or their inherent value. I was sorry that Dr. Miles did not stay for discussion when some of this may have become clear. I hope that his contribution appears in a published form.

I should not leave this subject without mention of the fascinating special lecture given by Mr. T. L. Chase of Chase Studio, Missouri. He and his team specialise in the production of palaeontological reconstructions and dioramas the like of which, judging by Mr. Chase's slides have never been seen in this country. The technical and artistic skills indicated were quite magnificent, disregarding any other arguments concerning the role of such dioramas in display.

Dr. Keith Duff presented a useful paper on the conservation of geological localities which hopefully broke new ground for some of the academic members of the audience. Perhaps it was in this light that the problems caused for conservation by geologists themselves were emphasised. Switching onto collections themselves one of the most startling papers to be presented at this colloquium was from Philip Doughty, read by Mike Bassett in Philip's absence. Based on the GCG survey of British geological collections, the real meat of the paper gave soem basic facts and figures about our geological heritage. Without quoting from the abundant statistics given the picture painted was an appalling one, and I look forward greatly to seeing a full report of this survey. One noteworthy fact is that it produced a 98% return from almost 700 questionnaires - a remarkable achievement.

Ron Cleevely and Dr. Hugh Torrens added to the perspective on geological collections, Ron presenting a review and present state of his work on an index of geological collections, and Hugh, in his own inimitable style making us both laugh and cry onthe subject of historic collections and their demise.

The conclusion on the colloquium was a lesson in chairmanship, provided by Dr. Douglas Bassett, Director of the National Museum of Wales. His brand of constructive steering helped provide a real basis for future thought and action as well as giving the audience a perfect platform for discussion and a hope that all the talking may lead to something. After some discussion of not only the immediately preceeding papers but also the whole meeting, Dr. Bassett outlined the five major areas of work which would form a programme for progress:

1. The means should be sought to publish the proceedings thereby providing not only a record of events but also a means of publicising our cause.
2. A summary of proceedings should be produced for wide circulation, particularly to the Museums Association for comment and digestion. The MA was criticised for lack of direction with regard to the scientific responsibilities of British Museums.
3. On the subject of geological conservation, progress was being made by the GCG's Committee for Geological Site Documentation. A two-day meeting was being organised in March 1979 when hopefully some of the problems raised by Keith Duff could be tackled.
4. Publicity concerning the deterioration of our geological collections should be sought, using as evidence a combination of material supplied by Hugh Torrens and Philip Doughty. Approaches to appropriate people and bodies would be made by Douglas Bassett.
5. If the fate of geological collections is to be improved then a concentrated effort must be made by the GCG on its "collections rescue" programme. Funds and academic expertise must be sought for this work which amongst other things would promote the working relationships between museum geologists and research palaeontologists.

This latter objective was amply supported by the spirit of this colloquium. I was very pleased to have been present.

John A. Cooper
Leicestershire Museums

COMMITTEE NOTES MARCH - JULY 1978

Committee has met once during the period under review; on 29th March at the National Museum of Wales, whilst the Committee for Geological Site Documentation met on 8th March and its Executive on four occasions.

The Colloquium on Palaeobiological Curating held at Cardiff from March 29th to 1st April was attended by over 100 delegates including a small but significant overseas contingent. In addition to the review included in this issue, the proceedings of the Colloquium are to be published as a Palaeontological Association Special Paper thanks to the generosity of both the Association and the National Museum of Wales. This will be eagerly awaited as there were several contributions to the proceedings which will be valuable additions to the literature relating to geology in museums. The Colloquium also served to direct attention towards problem areas and perhaps more importantly defined some solutions which Committee will be acting upon in due course.

A one-day specialist session was held at Edinburgh on July 8th as part of the Museums Association conference, largely as a result of a generous offer from Dr. C. Waterston of the Royal Scottish Museum. This was structured around a meeting held at the Scottish headquarters of the NCC aimed at clarifying issues for consideration at the March 1979 meeting on "The Future of Geological Conservation in the British Isles". Facilities and stores at both the Royal Scottish Museum and the Scottish Division of the Institute of Geological Sciences were examined as an adjunct to this.

The Secretary attended a meeting of the Specialist Groups Committee of the Geol. Soc. on 16th May to coordinate meetings programmes for 1978-79 as a result of which the following GCG meetings can be confirmed:-

8th December 1978. Hull University.
"Geological Collections in Hull - Past, Present and Future".
AGM included.

19th-20th March 1979. Geological Society.
"The Future of Geological Conservation in the British Isles" in association with the NCC and Earth Sciences Education Methods Group of the Geol. Soc.

4th-6th April 1979. BM(NH)
International Conference on the History of Museums & Col ctions in Natural History.
Society for Bibliography of Natural History , Biology Curators' Group and GCG.

19th-23rd September 1979. Sheffield
Meeting of British Geological Societies.
"Henry Clifton Sorby". Half or full day GCG Meeting to be incorporated.

Mike Stanley represented the Group at a Meeting of the Professional Groups Committee of the Museums Association on 22nd March at which discussion centred on arrangements for the 1978 M.A. Conference and various ways of improving collaboration between the Groups and the Association. The possibility of extending the scope of the Journal, Bulletin and Yearbook to cater for more specialist interests was considered as was also the question of information services generally.

The Group was invited to send a representative to a meeting of the Education Committee of the Geological Society on 16th March at which important issues relating to geological sites were to be discussed. Roy Clements Chairman of the Committee for Geological Site Documentation undertook to do this, the matters being more appropriate to his Committee.

As a result of an invitation from the Association of Teachers of Geology to nominate a guest editor for a special issue of "Geology Teaching" devoted largely to museums, Vol. 3 No. 2 June 1978 of the ATG's quarterly publication appeared with a pronounced museum oriented content. Andrew Mathieson, the GCG nominated editor, admirably succeeded in drawing together a series of articles on the educational aspects of geology in museums and combined this with a directory of museum education services in geology based on the returns from his recent questionnaire survey. It is planned to periodically enlarge and update this directory as a reference source for teachers.

COLLECTIONS AND COLLECTORS OF NOTE

16 THE J.G. CUMMING COLLECTION OF FOSSILS FROM THE CARBONIFEROUS LIMESTONE IN THE ISLE OF MAN

The Manx Museum, Douglas, is the final resting place of a battered collection of Carboniferous limestone fossils. Originally collected by the Rev. J. G. Cumming in the 1840s, they formed the basis of his brilliant stratigraphical study of the limestone deposits in the south of the Isle of Man.

Information on the career of Joseph George Cumming is best summarized by quoting Venn - Alumni Cantabrigienses:-

"CUMMING, JOSEPH (GEORGE). Adm. pens. at EMMANUEL, May 31, 1830. Of Derbs. (2nd s. of Joseph Notsall, of Matlock.) B. there Feb. 15, 1812. School, Oakham. Matric. Michs. 1830; Scholar, 1831; B.A. 1834; M.A. 1838. Ord. deacon (Peterb.) 1835; priest (Rochester) 1836; C. (to his uncle, James Cumming) at North Runcton, Norfolk, 1835. Classical and Mathematical Master at the West Riding Proprietary School, 1838-41. Vice-Principal of King William's College, Isle of Man, 1841-55. F.G.S., 1846. Head Master of Lichfield Grammar School, Staffs., 1855-8. Warden and Professor of Classical Literature and Geology at Queen's College, Birmingham, 1858-62. R. of Mellis, Suffolk, 1862-7. V. of St. John's, Bethnal Green, London, 1866-8. Married Agnes Peckham, 1838. Author, The Isle of Man, its History. Died Sept. 21, 1868."

When Cumming came to the island as Vice-Principal of King William's College in 1841 he was already interested in geology and had indeed spent much of his childhood enthusiastically collecting fossils in Derbyshire. As an undergraduate in Cambridge he had been in close contact with the group of geologists who worked with Adam Sedgwick, Woodwardian Professor of geology.

In the Isle of Man Cumming turned his attention to the local rocks and provided detailed and accurate maps and descriptions of its geology, reading a paper to the Geological Society of London in 1845 in which he presented his conclusions (Quart. J. Geol. Soc., London, 2, (1846), 317-48). He divided the limestone deposits of the southern basin into a sequence beginning with the Old Red Sandstone or Conglomerate, resting unconformably on the slate, followed comformably by the Lower or Castletown Limestone and the Upper or Poyllvaaish Limestone. The volcanic rocks of Scarlett were seen as evidence of volcanic activity in the area both before and after the final phase when the 'Posidonia Schist' or Poyllvaaish Black Marble were laid down. The fossil faunas were described as like those found in the Lower Scar Limestone in Yorkshire. The many dykes cutting these rocks were carefully described and illustrated. A coloured geological map of the island, as well as detailed maps of the southern limestone basin and seven sections, illustrated this paper.

In 1848 Cumming published his book entitled The Isle of Man; its History, Physical, Ecclesiastical, Civil and Legendary. The ideas from the earlier paper are here further developed and expanded; an Appendix lists fossils from Cumming's own collection: 222 species from the Carboniferous Limestone were presented as the basis for his stratigraphical divisions of these deposits.

Cumming left the Isle of Man to become Headmaster of the Cathedral School at Lichfield in 1855 and later Professor in Classical Literature and Geology at Queens College, Birmingham. His Manx fossil collection was left at King William's College where it was kept in the Old Chapel which served as Library and Museum. However, indifference, ignorance and fire soon caused labels to fall off and specimens to lose their proper contexts.

1892 saw the start of the Geological Survey of the Isle of Man and G. W. Lamplugh writes about Cumming's collection in the Memoir (1903, p. 251):

> 'His collection is still preserved in the Museum of King William's College at Castletown, but has unfortunately fallen into disorder, so that the majority of the specimens are now either without labels, or with labels insufficient for their identification. By the permission of the authorities of the College, we were allowed to pick out the labelled specimens, in which species of about one half of Cumming's list were represented, and these were redetermined in the Palaeontological Department of the Survey and returned to the College. It was at first intended to work out Cumming's synonomy in regard to these species, but the old nomenclature was in some instances so erratic that the intention was abandoned, as it was suspected that the labels had in some cases been shifted from their original specimens.'

This rescue operation did not, however, permanently protect the collection.

The next member of the staff of King William's College with a serious interest in geology apparently was the Rev. E. H. Stenning (later Archdeacon of Man). He came to the College in 1909 and found the collection in a sorry state of loose labels and general confusion. Stenning felt that this valuable collection should be made available to scholarly study and in 1919 he privately commisioned Captain R. W. Palmer (formerly of the Indian Geological Survey, then invalided out of the army and staying in Castletown) to classify and catalogue the collection. In February 1920 Stenning delivered an address to the Isle of Man Natural History and Antiquarian Society entitled 'The Life and work of the Rev. J. G. Cumming, M.A.,F.G.S.' (published in the Proceedings of the Society, vol. ii (1923-6), 402-14). He described Captain Palmer's catalogue as providing not only classifications of specimens in the collection, but also 'notes and drawings of an explanatory nature ... for the benefit of the amateur'. The collection is said to contain 'above 300 specimens, of which 240 have been catalogued.'

The Cumming collection was given to the Manx Museum on permanent loan in 1936, but Captain Palmer's catalogue did not accompany it, nor is there unfortunately any trace of this catalogue at King William's College. Correspondence in the Manx Museum suggests that Stenning provided a hand-list of the collection. This list, now in the Manx Museum, contains a summary catalogue of approximately 450 specimens. The numbers on this list correspond to rather crude and large red-painted numerals on the specimen. The author of this list is not known and, in view of the discrepancy in the number of specimen listed, as well as the crude character of the red numerals painted on the specimen, it seems unlikely that this is Captain Palmer's catalogue.

When, by kind permission of the Director Mr. Marshal Cubbon and the help of Dr. Larch Garrad, I was allowed to examine this collection in the summer of 1975, no less than five different sets of labels with names and numbers were attached to the specimens. These were applied in varying combinations, but all carried the red painted numerals relating to Stenning's list (except some thirty specimens which probably also belong to this collection). There is, however, no guarantee that labels attach to their correct specimens and no provenance can be established for any individual specimen. A new list of the whole collection, with broad classifications, was therefore compiled based on Stenning's list and the red numerals, including the previously uncatalogued group; in all 469 specimens. Some of the specimens from this collection are now on display in the Manx Museum, but most are in reserve.

The interest of the Cumming Collection lies largely in its historical association with the father of Manx geology. In its reduced and unprovenanced form it can no longer be said to be typical of the fossil fauna of the Manx limestone series. A number of good specimens have almost certainly been lost, since some species (of which numerous and good specimens are still available in the rock exposures) are represented by atypical and poor specimens, or are not represented at all. On the other hand, it is perhaps remarkable that some thirty trilobites remain in the collection, in view of the fact that these are difficult to find today and the rest of the Museum's collection contains only three examples. Another interest lies in the presence of specimens from exposures which are no longer available, as, for instance, the now partly water-filled quarries at Scarlett which yielded the splendid Prolecanites compressus.

The newly-made index is deposited in the Manx Museum and a duplicate copy has been placed in the Library of that institution.

Eva Wilson
London, April 1978

The Carboniferous Fossil Collections in the Manx Museum

The collections of the Manx Museum are, by intent, confined to things from the Isle of Man. These include some twenty drawers of fossils from the Carboniferous Limestone in the south of the Island. Mrs. Eva Wilson has very kindly compiled the above account of the main reserve collection, made by J. G. Cumming.

The bulk of the rest of the reserve collections consists of ill-localised and under-named material, mainly inherited from the "museums" of the short-lived Isle of Man Geological Society and the more durable Isle of Man Natural History and Antiquarian Society. The latter gave its collections to the Manx Museum when this opened in its present building in 1922. The Society will celebrate its centenary next year, when the Insular parliament celebrates its Millenium!

An attempt has recently been made to supplement this nineteenth century material with well-localised specimens although lack of staff time and expertise in processing and identification makes this inadequate. The main modern donations have been an extremely precisely plotted collection from Mr. R. Kenna (MM 65-97) from Poyllvaish and a large quantity of material, from slightly further north, from Mr. F. O. Taylor (MM 70-91), which was partly identified at the Institute of Geological Sciences.

The Natural History Gallery now has a small work area where the collections can be consulted by prior arrangement. The geological collections also include nineteenth century mineral specimens from Manx mines - poorly localised - and a representative collection of Pleistocene sub-fossil marine molluscs from the glacial deposits.

Larch S. Garrad,Ph.D.,A.M.A.,F.S.A.
Assistant Keeper

COLLECTIONS AND COLLECTORS OF NOTE

17 OAK HILL PARK MUSEUM, ACCRINGTON

In 1951 the museum at Accrington, Lancs., (founded 1900) was dispersed. An account of its history and its biological collections has been submitted to B.C.G. Newsletter. However, its holdings of geological material were also extensive and were largely the result of donations by:-

Dr. Conrad Gerland. "3 cwts." of minerals and fossils given on 14.11.1930 after his death. He and his father, Dr. B. W. Gerland, arranged the museum collections during 1900-1.

Col. John Wilson Rimington, (18.5.1832-4.7.1909). The 1933 "Guide" to the museum gives the total number of mineral specimens as 10,000 (possibly 18,000). The majority of these were probably donated by Rimington in 1900-1. He was born at Broomhead Hall, nr. Sheffield, had a Cambridge M.A. and lived at Lynton House, Upper Norwood, nr. Croydon. He also collected plants, insects and molluscs. Sales of his minerals were held at Stevens on June 10th, 11th, 1891, June 15th, 1892, and in Paris on 9.12.1912 after his death (1300 lots). There are a considerable number of specimens from the first two of these sales at Sheffield City Museums.

The 1933 "Guide" also mentions 2,000 Carboniferous fossils, but does not give their source.

In 1951 the museum's collections were destroyed, sold or given away. The fossils were dumped on a tip at Baxenden, nr. Accrington, along with some of the larger minerals, but the bulk of the mineral collection was obtained for Reading University where it remains virtually untouched. Dr. Roger Harker has recently compiled a detailed catalogue of the collection which will probably be split up into teaching, reference and exchange collections. At present the collection occupies some thirteen cabinets of about 10 drawers each. Dealers' names found among the specimens include Bryce Wright of London, A. E. Foote of Philadelphia and A. Krantz of Berlin.

Photocopies of all relevant literature, Dr. Harker's catalogue, the museum guide, inventories, etc., are retained at Towneley Hall Museum, Burnley.

I should like to thank Prof. P. Allen (Reading), Dr. R. Harker, Prof. F. Hodson (Southampton), Rosemary Preece (Manchester Museum) and T. Riley (Sheffield Museum) for their help in tracing this material.

M. A. Taylor,
Perth Museum & Art Gallery

COLLECTIONS AND COLLECTORS OF NOTE

18 BLACKBURN MUSEUM

Historical Development

Like so many others, the history of Blackburn Museum was closely linked with that of the library. Though museum activities were apparently not very significant until the institution of the Free Library in 1859, the events leading up to this date bear consideration. The sequence of events probably typifies the development of organised, intellectual activities in many northern industrial towns and is summarised in the Blackburn Times, 9 November 1889.

1787 A subscription library was founded by the Rev. Thomas Starkie. It opened in the old Grammar School and moved three times, ending at Flemming Square from where it was sold at auction in 1848. At this time it consisted of perhaps 6000 volumes; some volumes presented by the Records Commissioners were preserved and later handed over to the Free Library.

1822 A Linnaean Society was formed to study Botany and Natural History.

1831 A Scientific Institution was established with Dr. Whittaker as Chairman.

1839 Phrenological Society formed.

- these last three societies had rather brief careers.

1843 Blackburn Literary and Philosophical Society was formed, with Joseph Feilden as its president and Dr. John Skaife as curator. It possessed a "valuable collection of objects of Natural History and standard works". (Blackburn Times 9 November 1889). The collection included a "splendid specimen of opal" and one of silver ore "from the Meria de la Monte, Mexico, presented by Walter Scott M.D., late of H.M.S. Trident". The society also had a donation of conchological specimens from J. Glover Esq. of Heavitree, Exeter. (Whittle, P. A., 1852). The society flourished for some years and in 1852 tried to raise the money for a building by subscription. This was unsuccessful and the Society became defunct soon afterwards.

A good account of the society's curator, John Skaife (1799-1881), is given in W. A. Abram's book Blackburn Characters of a Past Generation published posthumously in 1894. Skaife was a well known local physician and naturalist, especially interested in rare birds. He frequently contributed to the Magazine of Natural History in the period 1835-45. He collected books and ancient coins. His coins and medals were sold at Sotheby's in July 1882; the sale lasted 6 days and realised £1796. His library was sold the following year, again at Sotheby's, and lasted for 5 days with more than 1700 lots.

The Blackburn Times (9 November 1889) states that a Mechanics Institution was founded in 1841 though a volume which appears to be the first minute book of the society (held in Blackburn Reference Library) begins its entries at 27 March 1844. Perhaps the first three years were rather less formally arranged. In 1844 it is stated to have had 2000 volumes, a newsroom and museum (Blackburn Times 9 November 1889). The society's aim was basically for an improvement in the dissemination of education to all sections of the community. However, natural selection gradually favoured institutions like the church night schools which had more resources. The introduction of the Free Library finally sealed the fate of the Mechanics Institution and its effects were sold at auction in 1868.

Following the Free Libraries act of 1850, the proposal to found a free library

was first put before the Blackburn Council in 1853 and was duly passed in August of that year, Blackburn being the seventh council to take this step. Implementation, however, was delayed until 1859 (due to heavy sanitary expenditure), when a room on the first floor of the town hall was provided for library purposes.

In 1863 the library moved to rooms belonging to the Exchange Company in Town Hall Street. The subsequent annual report notes that the first accommodation in the Town Hall had been cramped and, 'besides the loftiness and steepness of the stairs .... the crowd of persons who frequent the Borough Police Court blocked up the entrance for an hour, and often for a much longer period'.

The first librarian-curator was W. A. Abram. Appointed in 1860, he served until 1867, when he retired to become editor of the Blackburn Times. David Geddes was appointed his successor (at 30 shillings a week), and he appears to have applied consistent pressure towards an expansion of the town's museum activities. The annual reports of the period contain repeated appeals towards this end and for the establishment of a separate specimen purchase fund. However, the museum was to remain entirely dependent on the library income until 1899, when the council adopted the Museums and Gymnasiums Act of 1891, levying a rate of ¼d in the pound for the purpose.

The 1864 annual report, noting the move to Town Hall Street, records that the library's new home would be eminently suitable temporary accommodation until a new building could be supplied. By 1866, however, the report states that all the available shelf space in the library was full and that the contents of the museum were rather limited, considering the time since the institution's establishment. An appeal for specimens was made.

In 1872 a site was finally acquired for the new library and museum and the new building was opened in 1874 (see cover). In view of it's central position and proximity to the Town Hall it was hoped 'to render the institution one of the most flourishing in the north of England' (annual report for 1872). Woodsell and Collcutt were the architects, their entry being chosen from amongst eight supplied to Mr. Alfred Waterhouse for his selection. (Waterhouse, a well known exponent of 'Victorian Gothic' is perhaps best known for the British Museum (Natural History) and Manchester Town Hall.) The library occupied the ground floor with the museum on the first floor. (The museum now occupies the whole building, the library having moved back to premises in Town Hall Street.)

The annual report of 1877 again appealed for specimens, particularly geological ones from the local Coal Measures and advises that 'collectors should carefully wrap up specimens when found, with the particulars relating to them'. The following annual report also solicits more expansion for the museum, 'to make it worthy of the town'. However, despite Geddes' repeated attempts to expand museum activities at Blackburn these were in the end frustrated, as he died rather unexpectedly in 1889 at the age of 54.

Richard Ashton was appointed Geddes' successor and remained in the post until the end of 1937. Many of the historical details in this account are gleaned from his writings, including a manuscript 'chronology' held in the Blackburn Reference Library, and the museum accession register. For the early years the register is a copy of the donation lists appearing in the back of the annual reports, but unfortunately a complete run of the annual reports does not seem to survive. In particular, there are no surviving reports for the period 1873-76, when some of James Eccles' material was donated to the museum. The committee minutes do survive, but as might be expected, they are rather library-biased, though they do note most of the more important donations.

Staff at Blackburn Museum

Librarian Curators	W. A. Abram	1860-67
	D. Geddes	1867-89
	R. Ashton F.L.A.	1889-1937
	J. Hindle F.L.A.	1937-46
	J. W. Thomas F.L.A. F.R.Num.S.	1946-54
	W. W. Yeates F.L.A.	1954-73
Assistant Curators	P. Smith A.M.A.,F.G.S.	1962-65
	J. D. Blundell B.Sc. A.M.A.,F.G.S.	1966-71
	A. S. Lewis M.Sc.,A.M.A.	1971-74

From April 1974, the library moved to County Council control and the museum came under Blackburn Borough Recreation Department.

Director of Recreation	P. Sykes M.A.,D.M.A.,F.L.A.,MIRM	1976 onward.
Asst. Director (Arts)	A. S. Lewis M.Sc.,A.M.A.	1976 onward
Curators	A. S. Lewis M.Sc., A.M.A	1974-76
	M. A. E. Millward M.A.,A.M.A.	1976 onward.

Geological Collections at Blackburn Museum

1. James Eccles (1838-1915) (see G.C.G. 1. No. 6, p. 297: No. 10, p. 489 2. No. 1, pp. 41-42).

James Eccles was the eldest son of Edward Eccles of Liverpool, Edward being eldest son to William Eccles of Blackburn. William originated from the Eccles family of Lower Darwen near Blackburn, a numerous and notable cotton-spinning family who had opened their first mill in the 1770s.

A Blackburn gazetteer of 1870 gives James Eccles' address as Springhill House and describes him as a cotton-spinner. The Burgess List probably records the same address more correctly as 2, Springwell House, Shear Bank Road, Blackburn. He was a member of Blackburn's School Board in 1871 (along with W. A. Abram, the first librarian-curator), and he is noted as 'James Eccles J.P.' in the minute recording his 1873 donation to the museum.

By 1874, Eccles had moved to London; the Manchester Geological Society membership list for that year noted his address as 15, Durham Villas, Phillimore Gardens, Kensington. He had been elected a member of the Manchester society in 1866, and was vice-president in 1872, though, having moved to London, he understandably resigned in 1876. He remained a Fellow of the Geological Society from his election in 1867 until his death in 1915. He died at the same London address, and left £163,334 (The Times, June 7 and August 6, 1915).

James Eccles is probably best known as a mountaineer, and was particularly associated with the Mont Blanc area of the Alps. His obituary in the Alpine Journal (Vol 30) records his exploits in some detail and notes that he commenced Alpine climbing in the 1860s; it seems likely that his interest in geology developed at about the same time. In 1881, Eccles met Prof. T. G. Bonney (1833-1923) while climbing in the Alps and the two became friends with common interests in geology and climbing. Bonney contributed to Eccles' above-mentioned obituary notice.

Blackburn museum benefited from donations by James Eccles in 1871, 1873 and 1883. The 1871 donation is recorded in the annual report as 'geological specimens of rocks and fossils'. The 1873 donation, which probably preceded Eccles' move to London, was reported in The Blackburn Standard and Patriot of 20 December which recorded it as a 'valuable collection' including 'a most extensive series of fossils from the Carboniferous Limestone .... The collection ... contains numerous typical forms from various formations both in Britain and the Continent'. In February 1883, Eccles offered to present some books and rock specimens to Blackburn; these were duly accepted and he is noted as having forwarded them to the institution in April of that year. (Committee minutes).

It appears that James Eccles presented most of his geological collection to Blackburn Museum (except for the few specimens now known to have gone to the I.G.S. via the Museum of Practical Geology - see G.C.G. 2 No. 1 p. 42), as a number of separate batches. His minerals, however, are not specifically mentioned in any of the annual reports or minutes examined to date, though they are known to have been in the museum by 1901 (Goodchild 1901). It is possible that the 'fossils' of the 1871 accession may not have been fossils in the modern sense of the word, and 'rocks' may not have been petrological specimens.

2. David Geddes (1835-1889)

Geddes was a Scotsman, born at Thurso near John O'Groats. His lengthy obituary notice in the Blackburn Times records little of his early life, but notes that he came to the Blackburn area around 1864 as head gamekeeper at Witton Park. He succeeded W. A. Abram as librarian-curator against 93 other applicants for the post. He was apparently a well-read man, with great knowledge of many subjects, having obviously received a rather better education than his beginnings suggest.

Geddes was librarian-curator from 1867 until his untimely death in 1889. He seems to have been interested in geology and his most notable legacy is a large collection of glacial erratics. Geddes' collection was purchased after his death and an article in The Express (28 January 1890), mentioned that it filled 10 trays. The article also notes a visit by a party of British Association members (? local representatives of the Boulder Committee), to see the collection, and that they 'eulogised the careful descrimination which had characterised the selection of the objects shown'. The collection also included a selection of volcanic rocks from Arthur's Seat, Edinburgh.

Much of Geddes' material is still identifiable at Blackburn, the specimens have his labels attached. (see Fig. 5).

3. Other Material at Blackburn

In view of the small number of entries involved, the details pertaining to geological acquisitions are here quoted in date order for the early years of the museum's existence. The entries are mostly taken from the surviving annual reports and, unless quoted in full, the date given is that of the publication of the appropriate report.

1863 Mr. D. Johnson, pro. Blackburn Geological and Philosophical Society. (? the Lit. and Phil. Soc. referred to earlier). A number of mineral specimens and fossils.

Mr. O. S. Mortson, Burnley - A number of fish remains from the Burnley Coal Measure and other fossils.

1864 Mr. O. S. Mortson, Burnley - Specimens of Sigillaria and other fossils from the Burnley coalfield: chart of the Lancashire coalfields and descriptive pamphlet.

1868 Mr. J. W. Botherheim - Specimens of iron ore from Germany.
Mr. Brierley, Councillor - Catalogue of minerals in the cabinet of Mr. Thomas Chaffer, Burnley. 2 copies.

Mr. G. Walmsley - Fossil shells from Twiston Farm.

13 Sept
1871 Mr. J. Eccles - Geological specimens of rocks and fossils.

10 Dec
1873 James Eccles Esq. J.P. - Collection of British and foreign fossils (Committee minutes).

1879 Mr. D. T. Bathy - Cabinet of shells and agates. Purchased £21.10s.6d.

18 April
1883 James Eccles F.G.S. - Books and rock specimens (Committee minutes).

1890 Mr. D. Geddes - Large collection of geological and other objects. Purchased (after his death).

1891 Mr. R. Blackledge - Specimen of Calamite.

Dr. C. Gerland - Sharks teeth and vertebrae; Charleston River, U.S.A.

Mr. J. Carter - 6 specimens of polished limestone, Clitheroe.

Mr. Brenan - Ores and Spar; Lindal Mines, Furness.

1892 Fossil Red Deer head, complete with 21 point antlers, from bed of Ribble, near Preston.

Mrs. Gaine, Blackburn - Model of part of England, showing physical and geological features -(?the White-Watson section, cited on page 113 and illustrated in Fig. 2).

1894 Mrs. MacIvor - Specimens of iron ore etc.

1903 Mr. A. J. Robinson - Collection of fossils.

1908 Thos. Hart, Brooklands - Collection of fossils.

R. C. Pilling - Bequest of 5 cut agates etc.

1922 Mrs. Zerburgh, Woodford Place, Blackburn - Miscellaneous minerals and agates.

1937 Mrs. A. P. Midgley, widow of Arthur Preston Midgley, formerly of Blackburn - A small collection of miscellaneous rocks and fossils, 'not exhibited, placed with others in the cellar' ! (Accession register).

The museum also has a manuscript list of fossils from the lower Silurian Cincinnati group of the U.S.A.; collected by an A. G. Wetherby, together with a letter from him to A. P. Midgley dated 1885, concerning an exchange of material. It is not apparent whether the collection given by Mrs. Midgley contained this American material.

The Curation of the Collection

An interesting series of articles in 'The Bee' (1891-2), Blackburn Technical College's student magazine, criticizes the museum mercilessly. The layout and confused labelling of the geological exhibits comes in for particular attack. The criticism may have been justified, for in 1901 J. G. Goodchild of the Geological Survey, and custodian of the mineral collection at the Edinburgh Museum of Science and Art was engaged to come and arrange the collection. A guide to the mineral collection was duly produced (Goodchild, J. G. 1901). In the foreword Goodchild states that the Blackburn collection was largely based on Eccles' material, but that specimens selected from two other collections had been added to complete the series. These other collections remain unidentified at present, but one of them may have been the Literary and Philosophical Society Collection.

Nothing else appears to have been done to the collection until 1936, when

D. E. Owen, then keeper of geology at Liverpool Museum was engaged to come and re-arrange it. In return, Liverpool received the Solenhofen fossils of James Eccles on permanent loan. At present there are about 90 Solenhofen specimens at Blackburn, and Dr. Owen is of the opinion that they may well have been returned there at the outbreak of war (personal communication 1977).

Probably little else was done to the collection until the 1960s when P. Smith and J. D. Blundell held the assistant curatorship. At this time most of the fossils were listed and boxed.

The Present State of the Collection

The collection is partly housed in 24 stout wooden trays which slide into a wooden framework, and partly in about 120 boxes (mostly shoe boxes), supported on Remploy wooden shelving. There are also several trays and shelves with loose specimens. Clearly it would only be possible for a permanent member of Blackburn Museum's staff to examine everything. However, in the course of a few visits, a number of elements in the collection have become apparent, and these are detailed below.

1. 90 lithographic limestone fossils from Solenhofen, about 8 of which are badly broken. The material includes insects, crustacea (a very fine limulid), fish and cephalopods. The specimens are unlabelled, but are understood to be from the Eccles collection (Howarth and Platnauer, 1911). (see Fig. 1)
2. Numerous glacial erratic pebbles from Geddes' collection.
3. Many minerals, some boxed with labels, some newspaper wrapped in the wooden trays, but many exposed and rather dirty. None of the minerals appear to have attached labels, so Eccles' material will probably never be positively identified. Many of the minerals are good sized, hand specimens of a very acceptable quality.
4. About 100 of the boxes contain fossils and most of their contents appear to have been listed (manuscript lists at the museum). There are many Carboniferous limestone fossils probably mostly from the Eccles' Collection. Relatively few of the specimens have any labels physically attached to them. However, one series is notable. The labels are small paper discs with a printed heraldic bird above a number - e.g.

$\frac{21.4.58}{364}$ Cucullaea glabra; U. Greesand, Blackdown, Devon. (see Fig. 4)

$\frac{18.7.60}{6}$ Halysites

$\frac{16.12.90}{14}$ Calcite vein in marble (see Fig. 3)

$\frac{16.12.90}{7}$ Devonian marble; Torquay

Quite by chance these labels shown in Figs. 3 and 4 have lately been recognised as originating from the old Derby Museum in Liverpool (and now part of Liverpool Museums), now Merseyside County Museum. Geoff Hancock, an ex-Merseyside employee, happened to see the proof photographs which Brian Page (our editor) had returned to me, and he recognised the Liver Bird monogram.

It seems likely that the specimens were duplicates, transferred in the mid 1930's when Dr. Owen (of Liverpool Museum) was working on the Blackburn Collection. At any rate they now assume a new significance in view of the extensive war losses to the Liverpool Collection. An account of the collections known to have been at Liverpool is given in G.C.G. 1 No. 6 pages 255-259.

Fig. 1. A fine limulid from the Solenhofen lithographic stone, presumed to be from the collection of James Eccles.

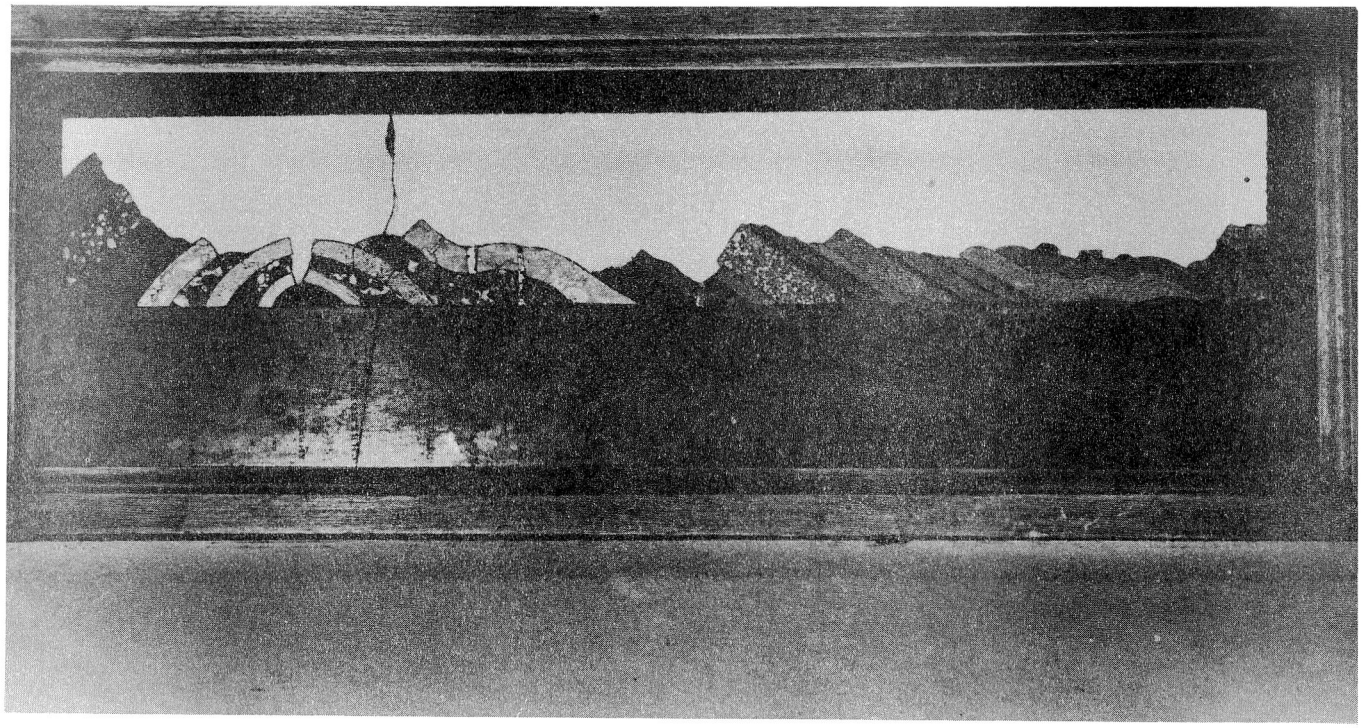
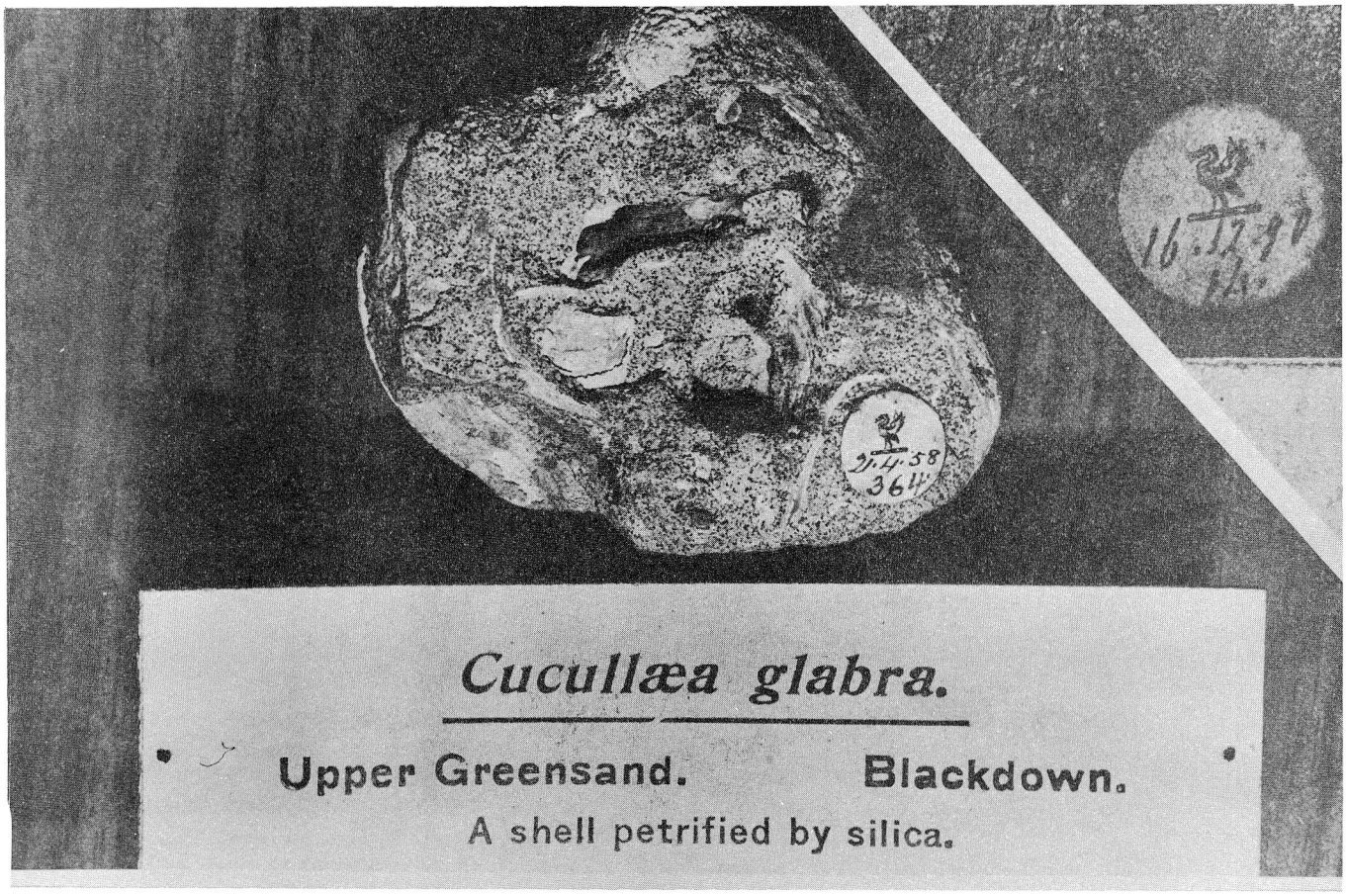


Fig. 2. White Watson tablet. This may be the 1892 donation by a Mrs. Gaine of Blackburn noted as, 'Model of part of England, showing physical and geological features', in a recently discovered manuscript accession list.



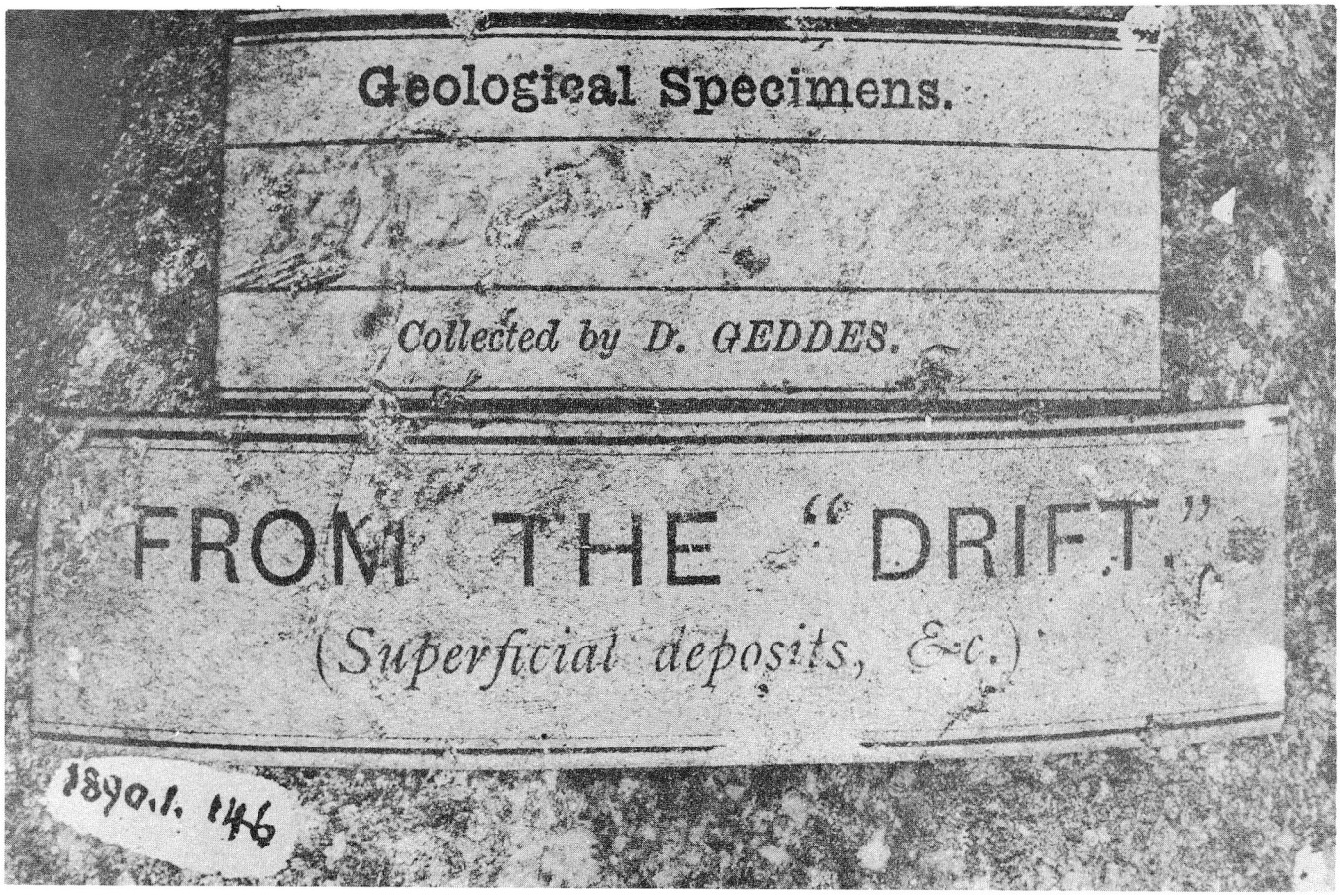


Fig. 3. Label with Liver Bird monogram from the Free Public Museums of the City of Liverpool (1890 stockbook does not survive).
Fig. 4. Label with Liver Bird monogram from the Derby Museum of the Borough of Liverpool. Specimen from the Charlesworth collection.

Fig. 5. Typical D. Geddes labels on specimen. The Accession number is a recent addition - circa 1965.

Geoff Tresise has kindly checked the surviving stockbooks at Liverpool and the Cucullea specimen accessioned in 1858 (see Fig. 4) turns out to be from the Charlesworth Collection which was thought to be entirely destroyed. It is unlikely that large numbers of such relics survive amid the Blackburn collection; however, the search for them will provide added interest for anyone working at Blackburn.

5. A White Watson geological section from Combs Moss near Buxton to Bolsover; history unknown, but see page 107. It is illustrated in Fig. 2.

6. Box of 60 small teaching minerals supplied by the dealer T. D. Russel; 78 Newgate St., London.

7. One 22 drawer cabinet of small mineral specimens.

Conclusion - a personal appraisal

The geological material at Blackburn is worthy of considerably better treatment than it has hitherto received. James Eccles may have been wiser than he knew when he donated his more notable specimens to the Museum of Practical Geology (G.C.G. 2, no. 1, p. 42). However he does seem to have given the majority of his collection to Blackburn and this includes some very interesting material. There can be few, if any, other provincial museums in Britain with 90 lithographic limestone fossils from Solenhofen.

Over the period of the museum's history one gets an impression of the best intentions, but considerably less than adequate resources - unfortunately an all-too-common story. As always, the main problem is lack of specialist expertise. However, the situation is not all bleak: advice on better storage has been gratefully accepted by the curator and it seems likely that new storage facilities could be available in the fairly near future. Hopefully the re-housing operation could be carried out, or at least supervised, by geologically trained staff - perhaps a 'rescue squad', organised by the G.C.G.

The lack of expertise indicates once more (as if it were really necessary) how useful peripatetic curators could be for specific disciplines - perhaps attached to existing County Museum Services. Valuable collections like the one at Blackburn would then be assured of more care and attention than the resident curatorial staff can provide, even allowing for the best will in the world.

Acknowledgements

I am particularly indebted to Mike Millward, the curator at Blackburn, and to Stanley Miller, local studies librarian at Blackburn Reference Library, both of whom were extremely helpful during the compilation of this account.

References

Much of the information herein was culled from annual reports, committee minutes, the manuscript chronological history of the library and museum (written by Richard Ashton, probably in the 1930s), and from two scrapbooks of newspaper cuttings concerning the library and museum - all of which are held in Blackburn Reference Library.

1852, Whittle, P. A.; Blackburn As It Is; printed by H. Oakey, Fishergate, Preston.

1873, Dec. 20; Blackburn Standard and Patriot; Local News, Free Library & Museum.

1877, Abram, W. A.; A History of Blackburn; Blackburn Times publ.

1889, Nov. 9, Blackburn Times, p. 2, Col. 2; Blackburn Free Library & Museum - A portrait of the late Mr. Geddes.

1891, Anon; The Bee (Magazine of the Blackburn Technical School) 1 No. 1; Strolls Through Blackburn Museum.

" Anon; The Bee, 1 No. 5; Strolls Through Blackburn Museum, 2.

" Anon; The Bee, 2 No. 2; Strolls Through Blackburn Museum, 3. With the Geology Class.

1892, Anon; The Bee, 2 No. 4; Strolls Through Blackburn Museum, 4. Local Geology.

1894, Abram, W. A.; Blackburn Characters of a Past Generation; Blackburn, 1894.

1901, Goodchild, J. G.; A Guide to the Collection of Minerals in the Blackburn Museum; Blackburn Times, publ.

1911, Howarth & Platnaeur; Museums & Galleries, p. 51.

1915, Alpine Journal 30 p. 198.

Alan HOWELL
Museum & Art Gallery,
Civic Centre,
Le Mans Crescent,
BOLTON, BL1 1SA

Post Script

Since the compilation of this account the geological collection at Blackburn has been approximately doubled in size. This follows the transfer there of the geological collection from the Rossendale Museum in Rawtenstall. This collection had languished in a damp, unlit basement, probably since 1928, the date of its newspaper wrappings. The collection's extent was only realised in 1977 following a visit by Alan Howell and Geoff Hancock to the Museum in Rawtenstall. At this time verbal agreement was reached with its curator that the collection should be transferred to an institution with the staff and resources to take care of it properly. Messrs. Howell and Hancock were also given to understand that a request for the transfer of the material to their own institution (Bolton Museum) would be granted.

Some months after an official request for the material had been sent by Bolton Museum, it became apparent that the collection had instead been offered to Blackburn Museum. Blackburn had accepted the offer even though they have no natural history staff.

The reason given for the change in attitude at Rawtenstall was a desire to see the collection remain in Lancashire. (Bolton moved from Lancashire to Greater Manchester at local government re-organisation).

The Rawtenstall collection has now joined another boxed collection in another museum basement and still has no geologist to curate it. Opposite are photographs of the Rawtenstall collection before and after its move to Blackburn (Figs. 6 and 7).

H. S. Torrens

Fig. 6. Rossendale Museum Geological Collection before move to Blackburn June 1978 (<u>after</u> removal from basement)

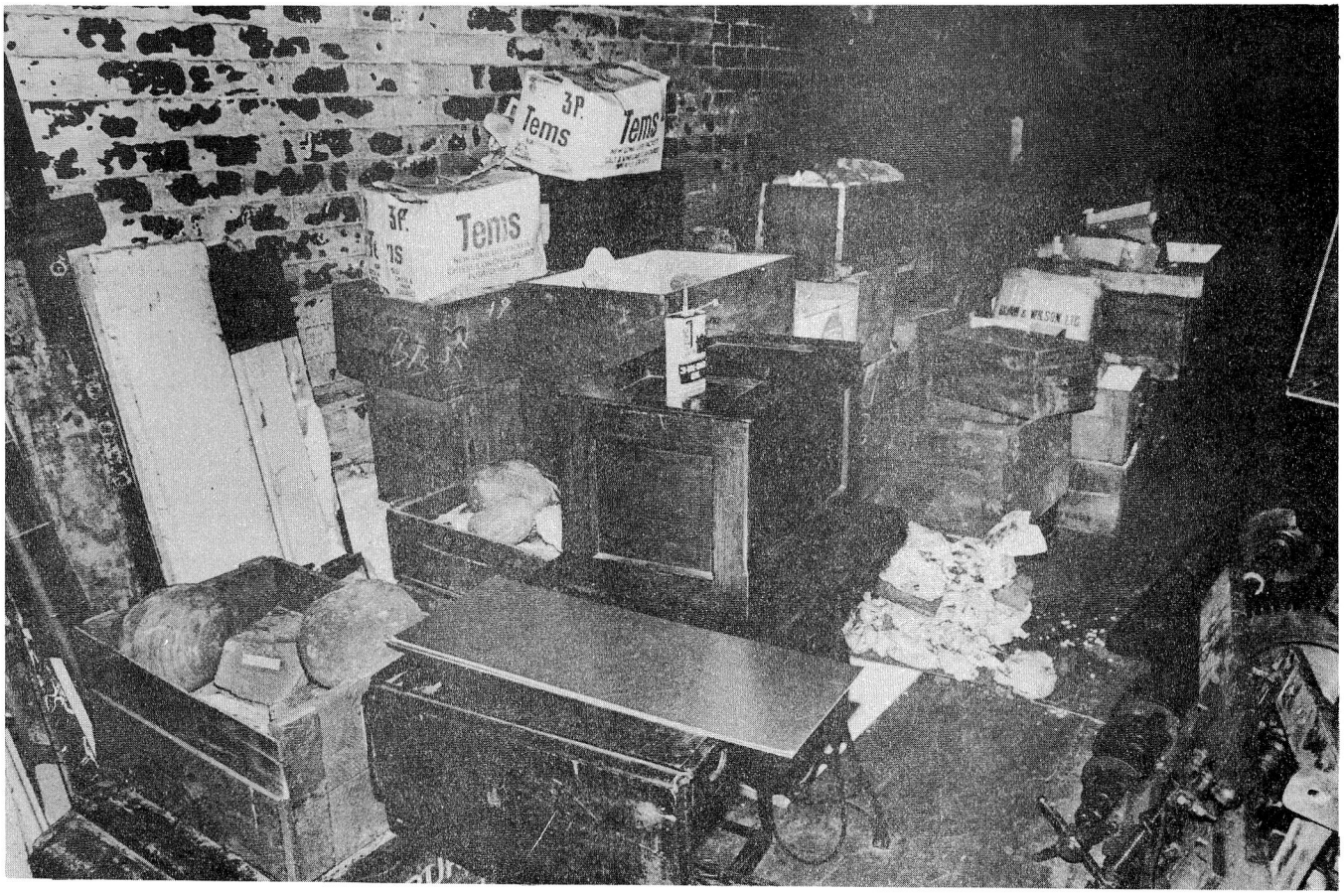


Fig. 7. Rossendale Museum Geological Collection in Blackburn Museum basement August 1978 (plus sewing machine etc.)

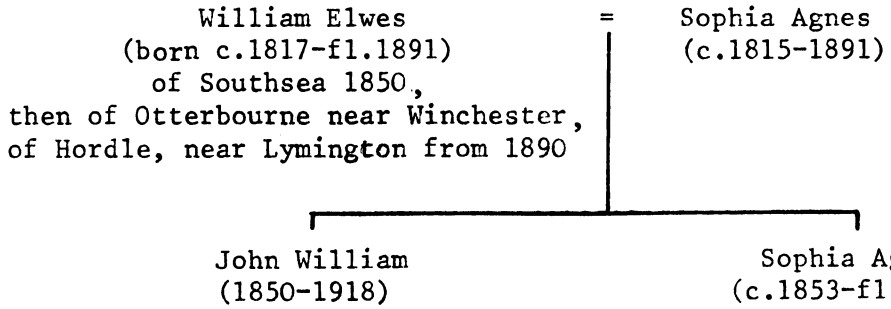
COLLECTIONS AND COLLECTORS OF NOTE

7 JOHN WILLIAM ELWES

In GCG 1 (2) p. 54, 58 and (4) pp. 165-169, we attempted to gather what material we could about this Hampshire geologist. New material has now come to light entirely thanks to an initial clue kindly provided by Dr. G. F. Elliott of the British Museum (Nat. Hist.). He recalled the encouragement he had received from the late A. G. Davis (1892-1957) in the period immediately before the Second World War with his work on Eocene brachiopods from the Catisfield cutting near Fareham which was even then long since overgrown. A. G. Davis had himself been similarly encouraged in his youth by William Whitaker (1836-1925), who had told Davis of the Catisfield section and of Elwes' work (1888) there. Graham Elliott recalled Davis saying that when Whitaker had a Hampshire Basin geology problem he would go and visit Elwes to discuss it. Elwes was however then in Broadmoor Criminal Lunatic Asylum.

With this vital clue we were able to complete the often sad story of the short career and geological activities of J. W. Elwes.

John William Elwes was indeed as previously suggested (GCG 1 4 p. 166) the son of William Elwes and born at Southsea, Hants. on May 16 1850. His immediate relations are shown below:-



Elwes junior is first heard of in 1869 when the entered University College, London. Elwes here passed his Preliminary Scientific examinations but left in 1871 having been elected to an entrance Scholarship in Natural Science at Christ's College, Cambridge to which he was admitted on June 12 1871 (Peile 1913 p. 619). However because of ill-health he never came into residence at Cambridge (Venn 1922 p. 418).

Thereafter Elwes lived in Hampshire and worked assiduously at the local geology as described in our earlier account. In May 1890 he was still listed as living at Otterbourne near Winchester (Proc. Hants. Field Club Archaeol. Soc. 1 (4) p. 5) but in about September 1890 the family moved to new rented accommodation at Hordle near Lymington on the Hampshire coast. The reason was obviously to combine family convalescence with facilities for his geological research, Hordle having been the scene of Elwes' earliest published geological work.

On 27 April 1891 Elwes' geological activities came to a sudden stop when he shot his sister and shot and killed his mother in their rented home. The crime is described in various newspapers including the Hampshire Telegraph and Sussex Chronicle Sat. May 2 1891 p. 2 col. 6 and a long account in the Christchurch Times Sat. May 2 1891 p. 5 which is reproduced here in its entirety

A SHOCKING CASE OF MATRICIDE AT HORDLE.

A shocking murder was committed on Monday morning at Hordle, three or four miles from Lymington, a man named Elwes shooting his mother, killing her on the spot, and attempting to kill his sister. The scene of the murder was a detached villa known as the Bays, which occupies a secluded position about 200 yards from the main road from Lymington. It was rented about eight months ago for occupation by an invalid gentleman, Mr. William Elwes, formerly of Winchester, aged 74; his wife, Mrs. Sophia Agnes Elwes, aged 76; their unmarried son, Mr. John William Elwes aged 41; and an unmarried daughter, Miss Sophia Agnes Elwes, aged 38. Mr. Elwes senior is bedridden, and his son, who enjoyed a separate income, came to Hordle with the family, partially on account of the facilities which the neighbourhood offered for geological research. The family were accompanied by a domestic servant, an elderly woman named Scriver, who had lived with them previously at Winchester. The son occasionally gave way to fits of temper, and at times behaved in a rather violent manner, quarrelling with his mother, but no dangerous symptoms appear to have manifested themselves until Monday morning when Mrs. Elwes, her daughter and son were at breakfast in the dining room (the father being in bed). A quarrel arose over the breakfast table, and the son got into a violent temper, smashing some of the breakfast things and behaving otherwise unseemly. Miss Elwes remonstrated with him, and, it is said, got up from the table, took a plate with some meat and bread, &c., and left the room apparently with the intention of finishing her breakfast upstairs. Her brother followed her, taking with him a revolver with which he had been in the habit of amusing himself in the neighbourhood. When in the hall he fired at her and the shot took effect in the right shoulder. Mrs. Elwes, attracted by a scream, went into the hall, and her son then turned upon her and fired three shots, all of which took effect in her, one in the throat having an immediate fatal effect. Mrs. Elwes fell on the front door mat and died almost immediately. Elwes then put the revolver down in the dining room, leaving two undischarged chambers, and sat down in an easy chair until the police arrived. In the meantime the housemaid, hearing the disturbance, ran out of doors for assistance. A coachman in the employ of Mr. Lambert, a neighbour, was despatched to Lymington (the Everton policeman not being at home), and on his way called at the residence of Dr. Chinery, who hurried to the scene of the murder, being the first to arrive there. P.S. Nunn, accompanied by P.C. Oram, hastened to the Bays without delay. There they received the revolver from Dr. Chinery and took Elwes into custody on the charge of murdering his mother. The only reply which he made to the charge was, "I am guilty of the capital charge, and would sooner hang than be brought in insane." Superintendent Foster arrived shortly afterwards and directed the removal of the prisoner to Lymington. Elwes willingly went with the police. Upon arriving at the police station, he was formerly charged with the murder of his mother, and in addition with the attempted murder of his sister. He repeated that he was guilty of the capital charge, and added, "For God's sake, don't try to prove me insane." Eleven loaded cartridges, stamped Eley 7, were found in the accused's bedroom.

The *Southern Echo* says:—"The terrible crime committed at Hordle is, without doubt, attributable to insanity. The prisoner is a member of the family of John Elwes, the celebrated miser of the last century, and the insanity which affected him seems to linger in the family, although it may take a different form. We have been shown letters which the prisoner wrote five years ago to a gentleman, who has kept them until now, believing that they might at some time be useful in proving that Elwes was not accountable for his actions. The gentleman in question had, of course, no suspicion that the unfortunate man was in danger of becoming the victim of a homicidal tendency, and the information that Elwes had shot and killed his mother and severely wounded his sister, was no less a surprise than a shock. The case is a peculiarly sad one. Elwes is a man of superior education, and won science scholarships at Cambridge on two occasions, but was compelled to give them up in successive years owing to failure of health. Since then, being possessed of private means, he has devoted himself to geological pursuits, and has been connected with important work in the county, some of the fossils discovered by him having been purchased for local museums. It would seem that he has for long been fearful lest the terrible heritage of madness should lead to his confinement in an asylum."

BEFORE THE MAGISTRATES.

At noon on Tuesday, *Elwes* was brought before the magistrates at Lymington, when there were present: Major Hammersley (in the chair), Lieut. Col. Clinton, Mr. D. Fullerton and Mr. F. Ellis. There was a large attendance of the general public, including several ladies.—The prisoner was brought into the hall at noon and was accommodated with a chair at the bar facing the bench. He is a slightly built man of about medium height, fair complexion, with sandy hair (slightly turning grey), and large dark sunken eyes. For some time he sat with folded arms, and throughout the proceedings seemed not very greatly concerned about the case that was being investigated, nor moved to the slightest expression of feeling by the grave nature of the charges which were being made against him. He carried in his hand a cloth cap corresponding with the dark grey tweed suit which he was wearing, and wore an unbuttoned collar. He was charged with the murder of Sophia Agnes Elwes the elder and attempted murder of Sophia Agnes Elwes the younger. He was undefended. Superintendent Foster conducted the case for the prosecution.

Dr. E. F. Chinery, of Lymington, who was the only witness called, said:—Yesterday, about 12.30 noon, I received a very urgent message to go to the Bays, Hordle, to see a Mrs. Elwes. I went at once. On my arrival at the gate outside I saw a man named Watson and another man named George Rickman, and also a woman servant named Collins. From what the woman told me I at once went to the house, and found the front door fastened. I then saw the prisoner looking out of the dining room window. I spoke to him through the window, and told him who I was and said I must come in at once. He told me to go round to the back door. I went round and entered through the kitchen. As soon as I got into the hall I saw the body of an elderly lady, whom I now know to have been Mrs. Elwes, lying on the mat across the front entrance. I saw at once that she was dead. I then opened the door of the dining room, which was shut, and walked into the room. The prisoner was sitting in an easy chair by the fireplace. I said to him, "I hear you have a loaded revolver? You must give it to me." He said, "It is not here; it is in the back room." I went to look for it, but could not find it. I told him it was not there, and he said "Do you not believe me?" He then offered to get it himself. I said, "No, I will find it." I went back again and found it without further difficulty. It was loaded in two chambers, and there was some dry blood on the muzzle. I kept possession of the revolver until Sergeant Nunn came, when I gave it to him. Shortly after I entered the house, the men Watson and Rickman and the servant Collins came in. Before this I had not seen anyone in the house except the prisoner. After the police came I went upstairs with the woman Collins and found Miss Elwes. She had a bullet wound in the back of the right shoulder. I attended to her, taking her into another room where there was an old gentleman, whom I understood was Mr. Elwes, senior. I left her with him, and again went downstairs, and with the assistance of the two men previously mentioned carried the body of Mrs. Elwes into the drawing room. We laid the body on the sofa where I examined it. I found a bullet wound in the front part of the throat, just below the thyroid

cartilage, and another bullet wound just under the left ear, the latter dividing the carotid artery, and death must have followed very rapidly. I went into the kitchen, where the prisoner was in the custody of P.S. Nunn and a constable, and in effect said to him "There are two wounds in Mrs. Elwes," and remarked that four chambers of the revolver were discharged. The prisoner without hesitation answered "I shot at my sister once, and three times at Mrs. Elwes." I said to him "Stop, you must not incriminate yourself," or words to that effect, "and what you say now will be used against you." He answered "This must either be hanging or an asylum, and I would rather hang." I think those were his exact words. I examined the rooms, and on the outside of the drawing room door, which is close to the front door, I saw several spots of blood. There were also blood spots on the wall close to the door. There was also a quantity of blood on the mat where Mrs. Elwes was lying. In the dining room where I first found the prisoner the table was upset. On the bottom of the stairs there were several pieces of cold meat and some bones, apparently beef bones, as if a dish or plate had been upset. The drawing room was also in a state of somewhat confusion. The prisoner was taken away by the police while I was present.—At the close of the doctor's evidence, prisoner said calmly: "I think the evidence is accurate, except that I don't remember the drawing room being in disorder. One of the victims reeled into the drawing room, and perhaps that accounted for it."

In reply to the Chairman, Dr. Chinery said he should think Miss Elwes would be able to appear in about a week's time unless some unforseen circumstance occurred. Dr. Chinery added that he had received instructions to make a post mortem examination, and he would then also be in a position to give other evidence as to the injury caused by the third bullet which prisoner said he fired at Mrs. Elwes.

On the application of Supt. Foster, prisoner was remanded for a week.—Prisoner said: "Have I not to plead?" and the Clerk answered "Not now."—Prisoner was conveyed to Winchester during the afternoon.

Mr. W. L. Bell of Southampton will appear for the defence next Tuesday.

THE CORONER'S INQUEST.

The inquest on Mrs. Elwes was held on Wednesday afternoon in the breakfast-room at The Bays, before Mr. Druitt, of Christchurch, coroner for the district. The jurors numbered seventeen, the foreman being Capt. Murray. Mr. W. Coxwell was present on behalf of the Treasury. The inquiry lasted about three hours.

The first witness was Miss Elwes, who attended with her right arm in a sling. She said: We have been living in this house for about seven months. Our family has lived together on ordinary terms of affection. My brother occupied himself as a geologist. There have been no quarrels or disputes worth speaking of between us. On Monday morning my mother, my brother, and myself were down for breakfast at nine o'clock. Nothing unusual took place during the breakfast time. After breakfast my mother and myself went to our usual household duties, leaving my brother in the breakfast room sitting at the fireside. Shortly afterwards he went into the garden to water the frame, and soon afterwards re-entered the breakfast room and threw over a table with some china on it. We heard it, and I came downstairs in about a quarter of an hour. When I got to the door of the room my brother went into the garden again. I went into the kitchen. My brother re-entered the house and stayed in the breakfast room. Shortly afterwards I went through the hall to go up-stairs with a plate of meat. My brother flew after me, and pulled me downstairs. I got up, and turned to go into the drawing room, when my brother fired at me, and hit me in the back. My mother rushed along the passage, and he turned round and fired at her. I went towards her to try and save her by getting between them, but was too late. He fired at her again, and she fell. He fired a third time at her. There had been no disagreement that morning between my mother and my brother. I went to get some water to bathe my mother, but found that she was quite dead. I then went upstairs to bathe my wound, and remained there until the doctor came. I knew that my brother was in the habit of keeping a revolver. He occasionally practised with it, but made no other use of it that I know of. Immediately after the firing my brother went to the piano and played a few notes.—In answer to questions, witness said her brother did not seem to be in a rage. He was rather "flarey." He was very nice the night before. At breakfast he seemed to be angry about something, but we did not know what. When he was in a temper we said nothing to him. He got into tempers sometimes, not often. He occasionally thrust the pistol at his mother, but did not let it off. I think it was loaded at those times.

Sophia Scrivener, a widow, employed in the house, said that Mr. W. Elwes had his breakfast on a seperate table in the breakfast-room, and was at it some time after Mrs. and Miss Elwes. She heard the table turn over. She afterwards heard shrieking, and ran out of the house frightened. She had not had cause to leave the house on account of disturbances before.

Willian Watson, a farmer living near, said that on Monday morning he took some messages to Mr. Chambers, who sent for the police. He went to The Bays, but did not go in, nor did he ask any questions, although Miss Elwes answered the door to him, and seemed agitated and trembling. He simply delivered a short message about a hen.

Dr. Chinery gave evidence similar to that given by him on the previous day. With respect to the *post mortem* examination, he said that he found a bullet wound in the left fore arm. The bullet, apparently, had entered on the outer surface and come out on the inner side. On examining the wound in the throat he found that the ball had impinged on the windpipe, and, passing downwards divided a large artery. There was a quantity of blood in the cavity of the chest. On the right side of the spinal column he found a small aperture, and there was a splinter hole in the vertebra. He could not find the bullet in the body, but the wounds would be caused by such a bullet as the one produced. The wound under the right ear showed that the bullet had passed through the angle of the jaw, and had lodged in the upper jaw bone, but he could not extract it without removing the jaw.—In answer to the Coroner, witness said that the wounds might have been self-inflicted, but that was most unlikely.

Jane Beck said that when "laying out" the body of Mrs. Elwes she found a bullet in the sleeve.

P.S. Nunn said that he went to The Bays on Monday morning. He saw Dr. Chinery, who said "This man has shot his mother" (pointing to Elwes). Elwes said "Yes. Wilful murder, I suppose." Witness charged Elwes with the offence, and told him that he would have to go to Lymington. He replied, "Very well. How are you going; ride or walk?"

Supt. Foster stated that he received a bullet that had been taken from Mrs. Elwes and also some of her clothes. He afterwards saw the prisoner at Lymington, and charged him with shooting his sister, to which he replied, "I am guilty of shooting her, and also of the capital charge of killing my mother. I shall either be brought in insane, or they will hang me, and I prefer to be hung sooner than have a life-long misery in an asylum. My father attempted suicide some years ago, but that has nothing to do with me." Witness asked him if there was any medical gentleman that he would like to see, or any friends that he wished to have communicated with. He answered, "Thank you. No, I am obliged, but I hope you won't try to prove that I am insane."

The Coroner briefly summed up, and the jury, after about ten minutes deliberation in private) returned a verdict of "Wilful Murder."

After his appearance before the magistrates on 28 April he was remanded to the Hampshire Assizes for trial on Tuesday August 4 1891. His trial was reported in the Times August 6 1891 p. 8 col. 6, the Hampshire Telegraph and Sussex Chronicle August 8 1891 p. 2 col. 3 and the Christchurch Times August 8 1891 p. 5 col. 5. He was found guilty but insane and ordered to be confined during Her Majesty's pleasure.

Elwes was admitted from Winchester Prison, where he had been remanded, to Broadmoor Criminal Lunatic Asylum on 11 August 1891. Here he remained until his death at 6.40 a.m. on 30 January 1918 aged 67. An inquest decided he had died from valvular disease of the heart and he was buried in the private cemetary in the grounds of Broadmoor. The site is no longer marked as the cemetery was re-landscaped some years ago. It is perhaps also worth recording that the Home Office file on him (A 52962) which would have yielded further information, is no longer in existence.

Thus is explained Elwes' disappearance from geology and from the next members list of the Hants. Field Club issued in October 1891. Elwes' geological collections however must have remained at the family home at Hordle, for it now seems clear that 1890 saw only the despatch of a small part of Elwes collection to the British Museum (Nat. Hist.). His fine collection passed later to the Yorkshire Museum. It is first listed in the Annual Report of the Yorkshire Philosophical Society publ. 1893 (for 1892) p. 8, 29 as "The Elwes Collection of Tertiary Fossils presented by the late William Reed (1810-1892) FGS". This was in the form of a bequest from Reed who died on 9 May 1892. It seems likely that Edward Charlesworth, who had a considerable interest in Tertiary fossils and purchased widely for Reed, was the intermediary in the transfer of the collection from Hampshire to Yorkshire in 1891 after Elwes had been committed, and that the collection only reached the Yorkshire Museum in 1892 where it remains to this day a tragic testimony to the unbalanced genius of John William Elwes.

It has not yet proved possible to locate the site of the Elwes home in Hordle. It may have been the house now called Danewood House, in Cottagers Lane at Hordle. Further enquiries will be needed to confirm this.

We gratefully acknowledge help from W. A. Barker, Headmaster of University College School, Maureen Maggs of Keele University Library, N. C. F. Clewley of University College, London, Charles Curry, editor of the New Milton Advertiser, Radio Solent and Radio Stoke who helped with the search for information about Elwes, Robert and Margaret Torrens and John Lavender of Red House Museum for help with the files of the Christchurch Times, Edward T. English of Broadmoor Hospital, P. Bradshaw of the Home Office, Barbara Pyrah of the Yorkshire Museum, the staff of Portsmouth Central Reference Library, Miss Elizabeth Lewis of Winchester Museum, A. T. Lloyd of New Milton and above all from Dr. Graham Elliott of the British Museum (Nat. Hist.) for the initial clue.

CORRIGENDA to the previous account - GCG 1 (4), 165-169.

p. 165 Wholesale disposal of the Elwes collections was not in 1890 (see text).

p. 165 line 6 Elwes the antiquarian
and p. 166 para 4 Elwes coll. of flint implements. These references are to be omitted entirely. They refer to G. R. Elwes (1842-1923) who was Hon. Treasurer of the Dorset Nat. Hist. Soc. (Proc. Dorset Nat. Hist. Arch. Soc. 44 , lxxv-lxxvi 1923).

p. 166 para 5 for Portsea read Southsea.

p. 166 para 5 Elwes did not attend University College School as stated.

p. 169 line 1 read Bramshaw.

H. S. Torrens
T. A. Getty
M. D. Crane

COLLECTIONS AND COLLECTORS OF NOTE

19 PHILPOT COLLECTION

This collection, made by three sisters of Lyme Regis, Dorset called Mary (1777-1838), Margaret (? -1845) and Elisabeth (1780-1857), passed in 1880 to Oxford University Museum. The collection has been described in two important papers published recently.

J. M. Edmonds 1978. The Fossil Collection of the Misses Philpot of Lyme Regis. Proc. Dorset nat. Hist. Arch. Soc. 98, 43-48.

H. P. Powell and J. M. Edmonds 1978. List of Type-Fossils in the Philpot collection. Oxford University Museum. Ibid, 48-53.

COLLECTIONS AND COLLECTORS OF NOTE

20 THE SHERBORNE SCHOOL MUSEUM COLLECTION

This fine collection extremely strong in fossils from the wonderfully fossiliferous Middle Jurassic rocks of North Dorset passed after years of neglect to the care of the British Museum (Natural History) in 1960 and has been incorporated into their collections.

The history of this school collection is of considerable significance as from 1875 to 1884 it acted as the Museum of the newly formed Dorset Natural History and Antiquarian Field Club and thus essentially as a Dorset County Museum. The history of the Museum and its collections in geology has been described by Hugh Torrens in "The Sherborne School Museum and the early collections and publications of the Dorset Natural History and Antiquarian Field Club" in the Society's Proceedings vol. 98 1978 pp. 32-42.

It includes a list of Type, Figured and Cited fossils known to have been in the collection and their present whereabouts if known, and includes notes on the following collectors:-

Rev. Henry Haydon WOOD (1825-1882)
Professor James BUCKMAN (1814-1884)
Hugo Daniel HARPER (1821-1895)
Edward CLEMINSHAW (1849-1922)
Miss PAYNE (fl.1874-1900)
John Clavell MANSEL-PLEYDELL (1817-1902)
Henry TRYON (1856-1943)
Robert Elliot STEEL (1853-1933)
Thomas Charles MAGGS (c.1824-1900)
William SHIPP (1809-1873)

COMMENTS ON SOME TYPE AND FIGURED BRACHIOPODS AND BIVALVES IN THE YORKSHIRE MUSEUM.

The purpose of this note is to bring attention to some missing details which we happened to notice in the valuable catalogue of fossils from the Yorkshire Museum recently published (Pyrah, 1976, 1977). The pointing out of a couple of these omissions in no way detracts from the laudable work done, but they will undoubtedly improve the usefulness and accuracy of the catalogue once incorporated in future editions and, in the meantime, the circulation of this information may be of interest both to palaeontologists and curators.

1) According to Pyrah's catalogue (1976, p. 41) the "type" of "Lingula parallela" Phillips used as a basis for Phillips' illustrations (1836, pl. 11, fig. 17-19) and Davidson's (1861-63, pl. 48, fig. 35), who merely copied them, bears the catalogue number YM83 and "does not match the figures" (sic) (thus apparently representing only a single specimen). Not long ago, however, when revising the Carboniferous lingulids from Scotland, Graham (1970, p. 146-148) discussed the existence of four unnumbered specimens of this species labelled as types (i.e. syntypes) at the Yorkshire Museum. Though he admitted that none could be related with absolute certainty to the original drawings, he attempted to identify the originals of Phillips' fig. 17 and 18, and in discussion only Phillips' fig. 17 and 19 were included in L. mytilloides Sow., for he differed from Davidson in placing with a query Phillips' fig. 18 into synonymy with L. straeleni Demanet. Moreover, he refigured all four specimens under these two different names (Graham, op. cit., pl. 14, fig. 10-12; and pl. 15, fig. 2) providing for the first time photographic illustrations of them. Not only should Graham's reference be added to the catalogue, but the question of whether just one specimen is now extant or whether all four were allocated the same number should be clarified as well.

2) On page 43 (Pyrah, 1976) the brachiopod YM868 is stated to be the original specimen of the Blake collection illustrated in pl. 15, fig. 13 of Tate and Blake (1876) as Waldheimia resupinata Sow. (in fact it is "variety a"). This form was later called Waldheimia florella (d'Orb.) var. a by Davidson (1878, p. 178), who figured a nearly identical specimen from his own collection (pl. 23, fig. 11). Subsequently this last specimen (British Museum Natural History No. B90749) was re-named Aulacothyris fusiformis by Rollier (1920, p. 346), and is the holotype of that species according to ICZN Art. 73a. More recently Delance (1974, p. 313), who ignored the definite indication by Rollier (1920, p. 374) that Davidson's figured specimen was the original (i.e. single specimen as opposed to type-series), unnecessarily designated YM868 as the lectotype of Rollier's species and, failing to recognize it in the Tate collection of the Geological Survey of London, then went on to choose British Museum Natural History No. B90749 as a neotype. For the sake of completeness, and despite the fact that it is herein shown that Delance (op. cit.) was wrong in designating both lectotype and neotype for a species whose holotype was fixed and extant, Pyrah's catalogue ought to have included an entry for Aulacothyris fusiformis Rollier, and reference to Delance.

3) In the Bivalvia section Pyrah (1977, p. 246) lists the specimens described and illustrated by Arkell (1934) as Ampliata ampliata (Phillips) (p. 283, pl. 38, fig. 1, neotype) and Ampliata elongata Arkell (p. 285, pl. 38, fig. 7-8, paratypes). Nevertheless, Arkell himself later realized that his new generic name Ampliata was a junior homonym of a helicinid gastropod genus, and in the Additional Notes and Correction of the same Monograph (1936, p. xx) he proposed Perampliata to replace it. There is no entry however under this latter name in Pyrah's catalogue. It is essential to incorporate this apparently overlooked change in

generic name in order to avoid confusion, since the type species of the gastropod genus Ampliata Wagner is also called Ampliata ampliata (Adams, non Phillips).

4) To the list of material illustrated by Arkell and said to be in the Yorkshire Museum but still awaiting recognition (Pyrah, 1977, p. 260) Navicula (Eonavicula) quadrisulcata (Sow.) : Arkell, 1929, pl. 1, fig. 4, should be added.

Finally, we gratefully acknowledge constructive comments by Dr. Torrens, which were helpful in improving an earlier version of section 2.

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COLLECTIONS AND INFORMATION LOST AND FOUND

COLLECTIONS AND INFORMATION SOUGHT

51. SPECIMENS COLLECTED BY H.M.S. "CHALLENGER"

I am currently, with Dr. I. D. Wallace of Merseyside County Museums, investigating the fate of specimens collected by H.M.S. "Challenger (1872-1876). This pioneer circumnavigating expendition collected numerous marine organisms and sediment samples as well as occasional terrestrial,biological and ethnographical specimens. Most material was eventually deposited at the British Museum where some 'duplicates' were later (1899-1900) redistributed to other institutions including the following:

Aberdeen, University
Aberystwyth, University College
Birmingham, Mason College
Bristol, University
Cambridge, University Museum
Cardiff, University College
Dundee, University College
Dublin, Museum of Science and Art
Edinburgh, Museum of Science and Art
Leeds, University College
Liverpool, Museums
London, Royal College of Surgeons
Manchester, Owens College Museum
Newcastle, Museum
Newcastle, Durham College of Science
Perth, Perthshire Natural History Museum
Sheffield, University College
Sheffield, Public Museums
Toronto, University
Warrington, Museum
Woking, Gordon Boys' Home
Worcester, Hastings Museum
Worcester, Victoria Institute

However these were not the only institutions to receive "Challenger" material as some items were obtained from experts identifying the specimens, members of the expedition crew or through subsequent re-dispersal from the original recipient institutions.

It is difficult to trace the movements of these specimens because of the number of individuals and institutions involved but I would be most grateful for any information on the present or past location of "Challenger" material if possible detailing the amount and type of material and how it was acquired.

Dr. P. F. Lingwood,
c/o Merseyside County Museums,
William Brown Street,
LIVERPOOL

52. HOLLAND, Miss of DUMBLETON, Glos. (fl. 1862)

Chris Duffin, 16 Ballingdon Road, London, SW11 6AJ is working on Liassic crocodile material and seeks news of any Upper Liassic sites or collections of Vertebrates and especially crocodiles. He is particularly anxious to locate the collections made by Miss Holland of Dumbleton in Gloucestershire in the 1860's and described by Thomas Wright in his note 'Report on Miss Holland's collection of Lias Fossils' in Proc. Cotteswold Nat. Field Club 3 153-156, 1865 and also noted by H. B. Woodward 1893 Jurassic Rocks of Britain vol 3 page 266.

see Found Section no. 52

53. B. BROOKS ? of Scarborough

Jane Holden of Sunderland Museum is currently accessioning a collection of Jurassic plant specimens, most of which were collected in East Yorkshire. The material came originally from Scarborough Museum and many have labels bearing large numbers ranging from 38 to 52. Many also have the names B. Brooks or

W. Hutton and these specimens are all from the Scarborough area. W. Hutton is thought to be William Hutton (1797-1860) born at Sunderland who died at West Hartlepool. Hutton was co-author with John Lindley (1799-1865) of the Fossil Flora of Great Britain 3 volumes 1831-1837, but B. Brooks does not appear in the lists of subscribers nor is he one of the many collectors named in the text. Despite a number of enquiries Jane has been quite unable to identify Brooks. Any information would be welcomed.

54. MURCHISON, Roderick Impey (1792-1871)

Dr. James C. BROWER of the Department of Geology, Syracuse University, Syracuse, New York 13210 USA is working on Silurian crinoids and seeks the holotypes of two of John Phillips species of Silurian crinoids described in Murchison's Silurian System 1839 page 674 and plate 17 figs. 4 and 5 as

Dimerocrinites decadactylus Phillips sp. nov. fig. 4
and
Dimerocrinites icosidactylus Phillips sp. nov. fig. 5

Murchison gave the crinoids to Phillips for description and often did not note from whose collection particular specimens came and to which many presumably then returned. Murchison did record that the first of these specimens (pl. 17 fig. 4) came from a Mrs. Downing - (see page 702), but noted only that the remainder came from the cabinets of [Benjamin Heywood] Bright - Mr. H. W. Inwood - and himself -

Murchison's own collection went largely to the Geological Society of London (see Silurian System 1839 p. 670) and the type and figured specimens from this 1839 work are listed in J. F. Blake's 1902 list of the "Types and Figured Specimens ... in the collection of the Geological Society of London" pp. 6-12 but it includes none of the crinoids.

To help locate the specimens sought we here reproduce the description and figures concerned and give details of the 3 other collections in which they were or might have been. (Data on 55-56 from H. S. Torrens)

Dimerocrinites decadactylus, Phil. Pl. 17. f. 4. nov.

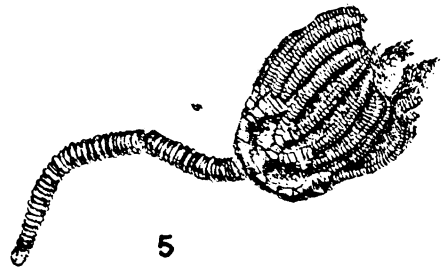
Intercostal plates remarkably large (as in *Hypanthocrinites*), and bearing on their summits an interbrachial plate. Fingers ten, those of the same pair separated by a small plate at their base, longitudinally sutured (i. e. composed of two rows of joints) and laterally plumose. Column formed of thin joints which project in the middle.

Dimerocrinites icosidactylus, Phil. Pl. 17. f. 5. nov.

The body of this must have resembled the preceding species very much. Its scapula gives origin to two arms, which again bifurcate into twenty fingers, composed of two rows of joints, furnished with lateral tentacula.

Columnar joints moniliform, and near the body thin.

4



5

55. DOWNING, Francis and Mrs. (fl. 1796-1843)

Mrs. Downing who transmitted the type of fig. 4 is the wife of Murchison's subscriber Francis Downing Esq. of the Priory, DUDLEY, Staffs. whose help

Murchison acknowledges on pp. xxix, 470, 475, 485, 490, 492, 653. Francis Downing was a mine agent of Dudley who from 1822-1843 was a member of the Dudley Canal Committee (see C. Hadfield 1966 The Canals of the West Midlands p. 109). Such activities explain an active interest in geology. Downing was a member of a notable Dudley landowning family and was mining agent to Lord Dudley from 1796 to 1836 when he was dismissed by Lord Dudley. (see V. L. Davies and H. Hyde. Dudley and the Black Country 1970 pp. 30-32, 57). He was mayor of Dudley in 1818, 1819 and 1831.

56. INWOOD, H W. (?Henry William Inwood 1794-1843)

Murchison also mentioned that some of the crinoids he used were from the cabinet of Mr. H. W. Inwood (1839 p. 702). Inwood does not appear in the list of subscribers to the book and little else seems to be known of him. The material seems to have come from Dudley (1839 p. 673) but Inwood may not have. There is a Henry William Inwood,a London based architect,whose dates are right and who is known to have been a collector of antiquities (see H. M. Colvin 1978 A biographical Dictionary of British Architects and the Dictionary of National Biography) but it is not known if he was also a collector of fossils and the man who lent Murchison material.

4. BRIGHT, Benjamin Bright (1787-1843)

Bright who has been the subject of an earlier appeal (qv) in this newsletter (1 (1) p. 18) also contributed crinoid material to Murchison. This has also not been located.

We might have recommended Professor Brower to try the fine collections of the former Dudley Mechanics Institute whose building was demolished in April 1968. But this would be simply a case of taking coals to Newcastle as it was Professor Brower whose letter published in the Wolverhampton Express and Star on January 5 1976, first brought the desperate plight of these collections to public notice.

Condition of fossils deplored

Parts of a world famous Dudley fossil collection are in a "deplorable" state, says an American university professor. According to Dr James C. Brower, professor of geology at Syracuse University, New York, some of the collection is housed in a "damp, soggy basement."

Other fossils form part of a "generally good" gallery display, but one rare specimen could not be examined without a complete showcase being taken apart.

The professor's comments are contained in a letter sent to Dudley's leisure and recreation department following a visit he made to Dudley last month.

According to a report to next Tuesday's meeting of the borough council's recreation and amenities committee, the letter "perhaps sums up the current position."

The report, drawn up by a senior council official, agrees that most of the collection is "inadequately housed in the basement of the museum."

Councillor Ashley Neale, leisure and recreation committee chairman, said today: "We cannot display the whole collection because of the expense of laying out a proper museum. As soon as we can we will do it in phases."

It is worth recording that a list of type and figured specimens in the Dudley collection has been published by G. Chandler and I. C. Hannah 1949 in "Dudley As it was and as it is today" Batsford, London, pages 5-11. It does not however include the specimens sought in this appeal.

This list of Dudley type and figured fossils does not seem to be generally known. It is not given in Mike Bassett's most useful "Bibliography and index of catalogues of type, figured and cited fossils in museums in Britain". Palaeontology 18 753-773, 1975 nor is it referred to by Robin Cocks in his fine "Review of British Lower Palaeozoic Brachiopods, including a Synoptic Revision of Davidson's Monograph". Palaeontographical Society Monograph 1978. This Dudley collection list contains 5 named specimens all figured by Davidson and all given as 'not traced' in Robin's revision. All of these come from the Capewell collection [L. P. Capewell of Dudley] from which one can gather this collection went to Dudley Museum.

57. SUFFOLK BOXSTONE FOSSILS

I have recently been requested by Mr. Arie Wanssen of Leiden University for information on any British specimens of Suffolk Boxstone fossils. This is for a forthcoming monograph on Miocene fossils. As such I would welcome hearing from any curator who has such fossils in their collections.

Boxstone fossils are common in the lowermost Red Crag deposits of Suffolk and were found in large numbers when many of the crag pits were dug for phosphates for fertilizers. They are typically rounded iron nodules with moulds of molluscs, particularly bivalves and gastropods many of which are probably Miocene in age.

Any information on collections of such 'boxstones' would be greatly appreciated.

P. J. LAWRANCE
Assistant Keeper, Natural History
Castle Museum
Norwich, NR1 3JU
Tel: 0603 22233 ext 638

COLLECTIONS AND INFORMATION FOUND

23. WILLIAM DAVID VARNEY (c.1896-1978) GCG 1 9 452
2 1 42-43

Tony Cross Curator of Peterborough City Museum sends the sad news that Mr. Varney died in April this year at the age of 82. Tony was not able to visit him again before his death. Apart from his geological interests Mr. Varney was a teacher at Deacon's School, Peterborough for forty years and both a founder member and past president of the Peterborough Photographic Society.

49. MISS MARY HANNAH FFARINGTON (1815-1888)

The ffarington collection sought by Nora McMillan, GCG 2, No. 2., formed part of a private museum of natural history and ethnography, maintained by the ffarington family at their home in Worden Hall, Leyland near Preston. The museum was sold along with the furniture and other contents of the Hall in 1948, but a large part of the collection of Pleistocene shells, and hundreds of rocks, minerals and fossil specimens were purchased by the family land agents, John Forrester of Leyland.

As a result of the note placed by Nora McMillan, I contacted Mr. Forrester,

and inspected the collection which was housed in a garage at Mr. Forrester's mother's house. Recently, Mr. Forrester, has received a number of requests from enthusiastic local historians for the loan of selected specimens - these would probably have been chosen on an ad hoc basis, without regard for the scientific information which can still be rescued, for display in a newly opened, small local history museum in Leyland. Fortunately, Mr. Forrester had not reached a decision on these requests, but as a result of discussions with the Lancashire County Museum Service, Mr. Forrester readily understood the need to curate the collections as a whole, and whilst he did not wish to surrender the collection in his lifetime, has agreed to a minimum 20 year loan to the Lancashire Museum.

It would seem that the ffarington family were avid collectors of natural history material, from an early date, and the family is thought to have purchased material from early nineteenth and possibly late eighteenth century collections. During the last 30 years, some of the shells have been broken, many are covered in thick layers of dirt, cardboard containers have collapsed and many labels have been separated from the specimens. However, we now look forward to cleaning and sorting the mineral, rock and fossil specimens and hopefully being able to report other collections found, in future issues of the Newsletter.

It is particularly gratifying to have located the shell collection, for its whereabouts was first queried with me by Nora McMillan in 1961! The publication of note 49, in the Newsletter of GCG was timely, it no doubt has prevented the loss of important geological historical data.

John BLUNDELL
County Museums Officer
Lancashire County Museum Service
Stanley Street
PRESTON, PR1 4YP

52. HOLLAND, Harriet Sophia (c.1835-1908) later Mrs. HUTTON mother of

52a. HUTTON, Harriet Mary (1873-1937)

This collection was made by Miss Holland eldest daughter of Edward Holland (1806-1875) Lord of the Manor of Dumbleton, before her marriage on 25 July 1865 to Crompton Hutton (1822-1910). (Burke's Landed Gentry 1952 p. 1335, pedigree of Hutton of Harescombe Grange). A continued interest in geology in the family is shown by her daughter Harriet Mary Hutton (1873-1937) who was a Fellow of the Geological Society and who made a fine collection of Cotswold fossils.

The Harriet Sophia Holland collection passed on her death to the Cheltenham Museum, see H. Woodward Geol. Mag. 1911, 5 (8) p. 307-11 [it contained the holotype of the crustacean Eryon richardsoni Woodward described in this paper] and L. Richardson 1929, The Country around Moreton in March. Mem. Geol. Surv. Engl. and Wales p. 14, 31-32. (see also Proc. Cotteswold nat. Fld. Club 3 58-60, 1865).

The Harriet Mary Hutton collection passed to a number of collections and we can do no better than to quote from a document preserved at Gloucester Museum entitled:

The wishes of Mary Hutton, September 1931

To the British Museum of Natural History:-

- Fossil Sponges with accompanying microscope slides and photographs
- Bryozoa, with slides and the letters referring to them, written by Dr. Lang and others.

To Professor Herbert Hawkins:- [Dept. of Geology, Reading University]

- The Sea Urchins, with the exception of Cidaris wrighti, figured by Richardson and Paris, in "Stratigraphical distribution of Inferior Oolite Echinoids of Western England, 1908". [Proc. Cotteswold nat. Fld. Club 16 pl. 17, fig. 3]. This is to go to the British Museum.
- He also had the choice of Encrinites from the Well House. [Haresfield Hill, Glos.].

To Gloucester Museum:-

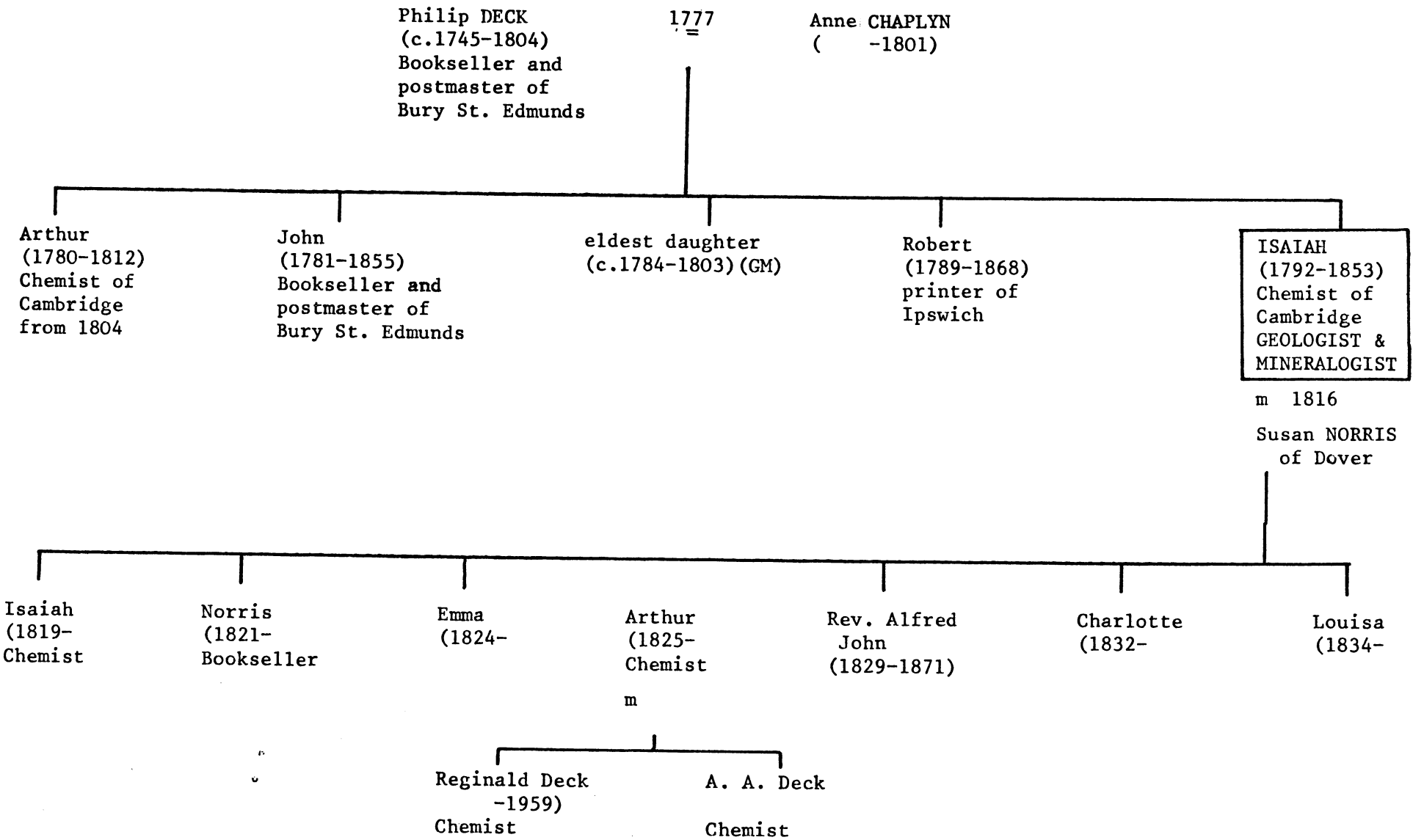
- Steneosaurus and Reptilian remains, from the Ashen Plain, Dursley, and the Brachiopods found with them, which were named by Dr. Buckman. Together with Dr. Buckman's letters referring to them. [This also includes some of the paratypes of Stelletta huttonae Dighton Thomas described in 1930 Proc. Cotteswold nat. Fld. Club 23 pp. 265-267 from the Inferior Oolite of Gloucestershire and the holotype of the barnacle Pollicipes aalensis Richardson described in 1908 Geol. Mag. (5) 5 pp. 351-352 and 1909 Proc. Cotteswold nat. Fld. Club 16 pp. 265-266].

The British Museum had the pick of the fossils, but the rest went to the Museums in Gloucestershire, Gloucester having first choice, then Stroud, and lastly, Cheltenham.

The collection was largely of Inferior Oolite fossils from Stroud and Dursley but included material from elsewhere as noted by K. P. Oakley and H. D. Thomas in 1937 Proc. Cotteswold Nat. Fld. Club 26 p. 106. It contained some real rarities including some of the Inferior Oolite Stromatoparoids described by G. A. Kellaway and S. Smith 1938 Stromatoparoids from the Inferior Oolite of South West England. Quart. Jl. geol. Soc. 94 pp. 321-330.

H. S. Torrens

SKELETAL FAMILY TREE of DECK FAMILY of CAMBRIDGE



28. ISAIAH DECK (1792-1853) GCG 1 455, 487
2 43, 83

Continuing the story of the Decks, Chemists of Cambridge

1. ANCESTRY

We first hear of the Deck family in Cambridge in 1804 when Arthur Deck advertised that he had opened a shop in Market Hill, Cambridge, (Cambridge Chronicle, 21st July 1804), trading as a Chemist and Druggist.

The first Deck chemist shop at Market Hill, Cambridge - circa 1805

By 1808 he was bankrupt (C.C. 26th November) and his shop and house were up for sale (C.C. 10th December 1808), one of the assignees being his brother John Deck, Postmaster of Bury St. Edmunds (C.C. 1812). Another brother was Isaiah Deck the geologist and mineralogist.

The father of these three and of a fourth brother Robert who became a printer in Ipswich (see p.134) was Philip Deck born in 1745 who died on 5 April 1804 (Gents. Mag. April 1804, p. 389). He was "an eminent bookseller" and like his son John "many years postmaster of Bury St. Edmunds, Suffolk". He published some religious tracts, one of which, dated 1792 and printed in Ipswich, is preserved in the British Library. He was a bookseller at Bury at least from 1782 when he issued a sale catalogue (J. Nichols Literary Anecdotes 3 p. 674) which does not seem to have survived. In John Pendred's 1785 Directory of the Book Trade he is listed as "Deck, Stationer, Crown Street". The West Suffolk Record Office has a pedigree of the Deck family which has yielded some of the information given here.

Arthur Deck died at Barnwell, near Peterborough, in 1812, "whilst at drill with the 2nd Company of the Volunteers of the Cambridge and Cambridgeshire Riflemen", which he commanded (C.C. April 13th, 1932). He was buried at Bury St. Edmunds.

2. ISAIAH DECK. father and son

Isaiah Deck, a second brother of Arthur Deck was born at Bury St. Edmunds in 1792 (Cambridge census 1841, 1851). Isaiah was an apprentice to his brother Arthur at the Market Hill shop for three years, after which "he went forth into the world to gain experience" (C.C. April 13th 1932) - it is possible that he spent some time in Germany, at Berlin and Giessen (see p.136).

In either 1815 ('Victorian and Edwardian Cambridge from Old Photographs', F. A. Reeve) or in 1825 (C.C. April 13th 1932)- this later date seems most likely as he was described as of Harwich in 1817 (GCG 2 (2) p. 83) Isaiah Deck returned to Cambridge and opened a chemist's shop in Trumpington Street, afterwards moving to 9 King's Parade, and continued trading there until his death in 1853. (see fig. 1)

Isaiah Deck was obviously a versatile man; he not only traded as a chemist but advertised himself as a mineralogist who "furnishes every description of Geological specimens from the various localities of England and the Continent - Fossils ... volcanic rocks and minerals ... single specimen to extensively fitted up cabinets, arranged according to Mr. Webster's paper in the Geological Transactions" (C.C. 28th January 1836).

He also perfected a method of casting fossils which must have been very advanced and which enabled him to cast very large specimens as well as small. This business must have been extensive because around 1843-1848 he had individual printed labels for his casts. He presented casts of fossils to the Geological Society of London on November 17th 1838 and June 5th 1839 (GCG 2 (1) p. 43).

Isaiah Deck married Susan Norris of Dover, Kent, in July or August 1816 (GCG 2 (2), p. 83). There is no doubt that Isaiah Deck of Cambridge and Isaiah Deck of Harwich are one and the same person, because Susan Deck is listed as the wife of Isaiah in the Cambridge censuses of 1841 and 1851 and their second son was christened Norris. Isaiah and Susan had four sons (Isaiah born 1819, Norris born 1821, Arthur born 1825 and Alfred born 1829), and three daughters, (Emma born 1824, Charlotte born 1832 and Louisa born 1834) (Cambridge census 1841).

At the time of the 1841 census Isaiah Deck junior was listed as a chemist like his father, and Arthur Deck, now 16 years old, as an apprentice chemist. Norris was given as a bookseller but Alfred was not listed, and neither does he appear on the 1851 census. The only reference to Alfred in Cambridge which I have found refers to a private baptism held at St. Edward's Church, Cambridge on 29th November 1829 (Transcript of Registers of B.M. & D., St. Edwards, Cambridge).

But it is now known that Alfred John Deck described as son of Josiah [recte Isaiah] Deck of Kings Parade entered Cambridge University - Trinity College

Fig. 1. The Deck family chemist shop at 9 Kings Parade, Cambridge in 1902.

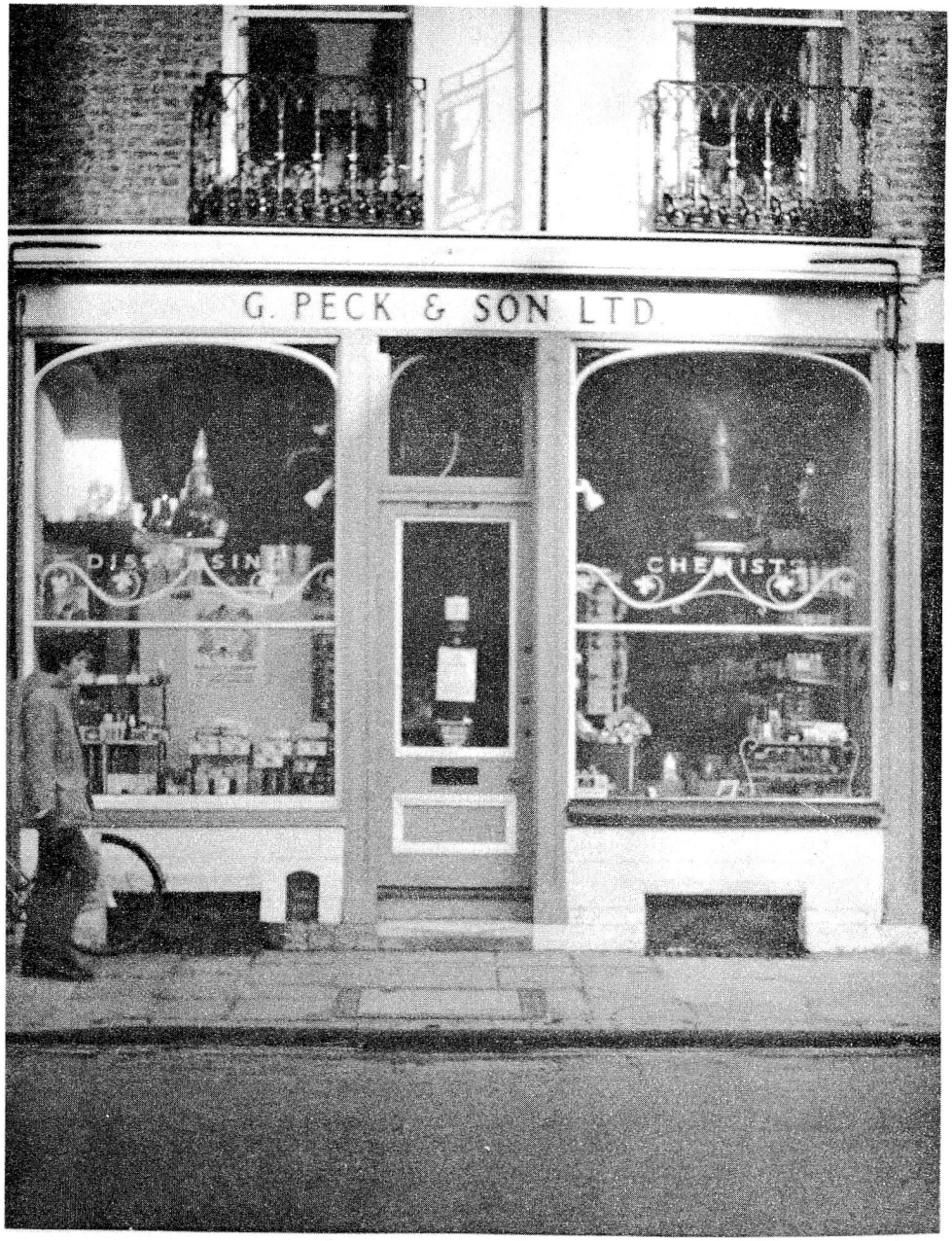
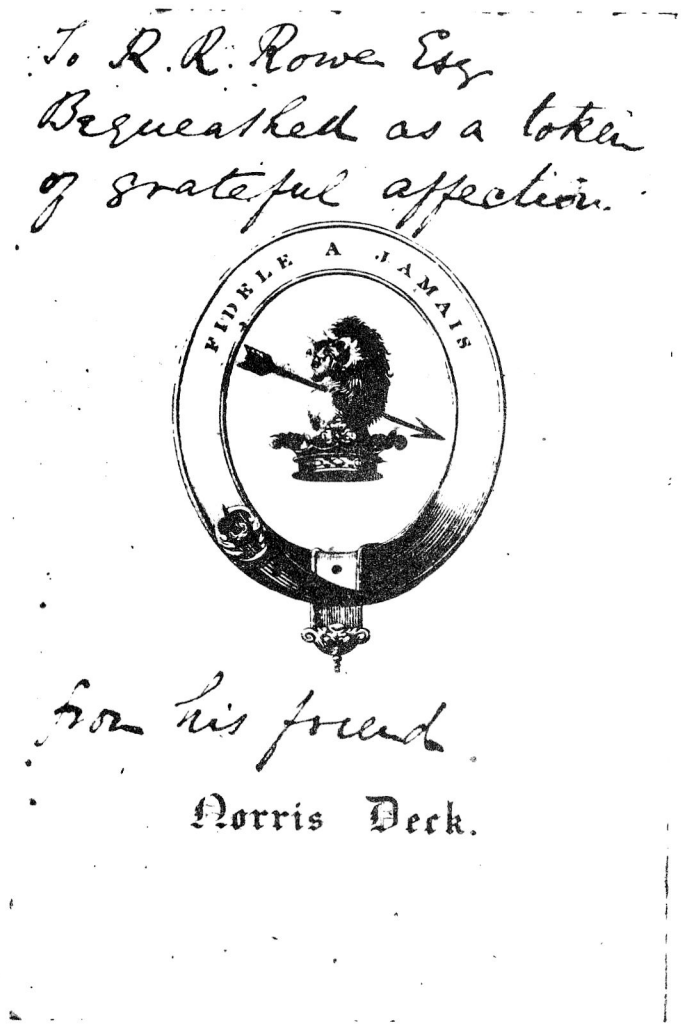


Fig. 2. The same shop still a chemists - but now run by G. Peck and Son Ltd. 1978.

in 1848. He graduated BA 1852, married in 1854 (Gents. Mag. July 1854, p. 69), and was awarded his MA in 1855. He was curate of St. Thomas's Winchester from 1853 to 1854 but in 1855 he became Professor of Mathematics at the Royal Military College, Sandhurst until his death on 14 July 1871 (see Venn and Boase).

By 1851 the census records show Isaiah Deck, his wife Susan and Norris the bookseller were living at 9 King's Parade with their three unmarried daughters and their assistants, apprentices and servants. Norris produced "Deck's Suffolk, Norfolk, Essex and Cambridgeshire Pocket Almanac" for 1839 ("Just published 2^{s} 6^{d}", C.C. 15th December 1838) as well as two editions of "A handbook for visitors to Cambridge" in 1861 and 1862. A paper he read before the Cambridge Architectural Society on "The Ecclesiology of Cambridgeshire" was published in "The Ecclesiologist" in 1860, and other publications by him are listed in the British Museum catalogue.



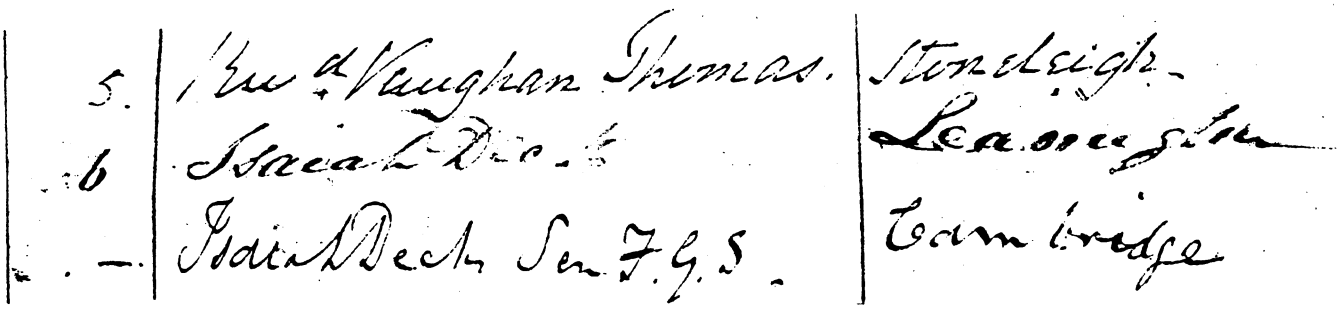
Bookplate showing family crest of Norris Deck in a copy presented to his father Isaiah senior of J. Buckman & C. H. Newmarch's "Illustrations of the Remains of Roman Art in Cirencester" 1850 (owned by H. S. Torrens)

In 1843 Isaiah Deck advertised the opening of a chemist's shop at 6 Victoria Terrace, Leamington Spa (Leamington Spa Courier and Warwickshire Standard, April 1st 1843). During the five years that this business existed there appears to have been constant confusion as before about the florid initial 'I' of Isaiah Deck's

name. Even the advance notice of the opening of the shop was printed as 'J. Deck (of Cambridge)', (Leamington Spa Courier and Warwickshire Standard, April 1st 1843), and the entry in the Leamington Parish Rate Book was 'Josiah Deck' (27th July 1843). This is the only mention of Josiah and the final entry in the Parish Rate Book of 1848 is as Isaiah and subsequent careful checking both in advertisements and old records of the Warwickshire Natural History and Archaeological Society have shown that I and J were interchangeable at that time. I believe that this shop was run by the younger Isaiah with close contact and supervision from his father in Cambridge. An interesting page in the Visitors Book of the Warwickshire Natural History and Archaeological Society for June 6th 1843 shows both the signatures:

'Isaiah Deck, Leamington

Isaiah Deck Sen. F.G.S., Cambridge'



During 1843-1848 weekly advertisements for the Leamington Spa shop were appearing in the Leamington Spa Courier, which frequently mentioned 'at 6 Victoria Terrace (Leamington); and of 9 King's Parade, Cambridge'.

The Warwickshire Natural History and Archaeological Society was founded in 1834 and collected extensively for its museum which was housed in the upper room of the Market Hall at Warwick. It is from this Society that the present County Museum of Warwickshire was formed, and which now occupies the whole of the Market Hall. Isaiah Deck of Cambridge became a member of the Society in 1843 and the 9th Annual Report of the WNHAS (1844) contains the entry:-

'Mr. Isaiah Deck F.G.S., Member of British Assoc.
Member of Pharm. Soc. Great Britain,
Leamington.

Honorary Curator of Entomology, WNHAS'.

This must have been Isaiah Deck senior of Cambridge who was elected a Fellow of the Geological Society (Reg. no. 1205) on 4th April 1838 (GCG 2 (1), p. 43). A letter received from the Librarian of the Geological Society on 3rd April 1978 confirms that only one Isaiah Deck was on their list of Fellows.

During the years 1843-1848, while the business at 6 Victoria Terrace was functioning, the Decks (and there appears to be no way to be sure whether it was father or son or both) made numerous donations to the Society (see Appendix I).

As early as June 1843 casts of Asaphus caudatus (we have a printed label with the name of the fossil and Mr. Deck, Cambridge) and Calymene blumenbachi were given (Donation Book 1836-1862 WNHAS), together with a book "System of Geological Arrangements" by I. Deck, F.G.S., 1841, printed by brother R. Deck Ipswich (Robert Deck - Pigot's Directory 1839) for the library, which we still have on our shelves.

A SYSTEM

OF

GEOLOGICAL ARRANGEMENT,

INTENDED AS A

CATALOGUE

TO FACILITATE THE CLASSIFICATION OF ROCKS,

AND

GEOLOGICAL SPECIMENS;

TO WHICH IS ADDED,

DIRECTIONS

FOR

COLLECTING FOSSILS & GEOLOGICAL SPECIMENS,

By I. DECK, F. G. S.

ASSOCIATE OF THE BRITISH INSTITUTION FOR THE ADVANCEMENT OF SCIENCE, AND MEMBER OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

IPSWICH:
PRINTED BY R. DECK.

1841.

In July 1843 casts of Gryphaeus callitelus, Isotelus cyclops, palatal tooth of Ptychodus polygyrus and two insects were listed in the Donation Book WNHAS, as given by Mr. Isaiah Deck. Three casts of trilobites in September 1843, numerous impressions of seals in 1844, a cast of the skull of Thistlewood [Arthur Thistlewood (1770-1820), English organiser of the Cato Street Conspiracy to murder Castlereagh and other ministers, convicted of high treason and hanged] and Geological models of the Isle of Wight and section showing Alum Bay and Headon Hill in 1846 were donated by Mr. I. Deck of Leamington. The Museum also possesses a fine cast of the head of Ichthyosaurus communis which bears two printed labels, one with the name of the fossil and 'Mr. I. Deck, Geologist, Cambridge', and another describing the fossil skull. A cast of Ammonites henslowi and a "mummy" of a penguin were also given by 'Mr. Deck' in 1846. A Mrs. Isaiah Deck presented a suite of fossils from the Crag of Norfolk and Suffolk in 1844 (Report WNHAS). There are ten fossils, gastropods, lamellibranchs and small vertebrae and other bones.

One or both of the Isaiah Decks also gave lectures to the members of the WNHAS at their quarterly meetings. Mr. Deck of Leamington gave a lecture on "New and interesting discoveries in heat, light and magnetism, illustrated by striking experiments" (2nd October 1843) and "on the first principles of chemistry and chemical analysis with its application to art, manufacture and agriculture" (3rd April 1845).

By 1848 Isaiah Deck was no longer listed either as a member or as Honorary Curator of the WNHAS; the Decks had left their Leamington Spa shop between the Parish Rates entry of 27th April 1848 and the next register of 14th June 1849, when a Frederick William Tabberer had taken over the shop.

I have not yet been able to discover Isaiah Deck senior's exact connection with Germany but two advertisements in the Leamington Spa Courier (July 1st 1843 and November 11th 1843) mention "chemical analysis ... performed with the same rigid exactness as at the laboratories of Berlin and Giessen", and in the later advertisement "(late of the laboratories of Berlin and Giessen)". That Isaiah Deck of Cambridge was an active, inventive man seems without doubt. The portrait which may be of him or his son which I discovered in the Cambridge Collection of the Central Library in Cambridge is of interest.

Isaiah Deck

Portrait of Isaiah Deck lithographed by J. A. Vinter and printed by Day & Son lithographers to the Queen. There must be some doubt as to whether this is father or son. John Alfred Vinter (1828-1905) first exhibited his work in 1847 and was an exhibitor at the Royal Academyy from 1848 to 1902. In view of these dates and the apparent age of the sitter it seems most likely to be of Isaiah junior.

Isaiah Deck Senior died on 5 November 1853 and an announcement by his son Arthur Deck appeared on 25th February 1854 in the Cambridge Chronicle, "Having (conjointly with his brother) succeeded to the business of his late father, and to the possession of all the valuable recipes for which he was so justly celebrated ... A.D. having had several years experience in some of the first establishments in the West End of London ..." It is possible that these two sons of Isaiah were Arthur and Isaiah junior, though I have so far been unable to find any further mention of Isaiah junior.

3. DESCENDANTS

Arthur Deck, however, became a prominent man in Cambridge, running his shop and advertising not only chemical preparations, but also equipment such as barometers and thermometers and "every instrument for meteorological observations" (CC March 25th 1854). He became a councillor in 1858 (CC 1900), later Alderman and was still a senior member of the Cambridge Town Council in 1900. Both he and his father Isaiah were renowned for their pyrotechnical abilities (The Cambridge Graphic - Cambridge Character sketches, 25th August 1900). He was eventually succeeded by his son, A. A. Deck. Reginald Deck, another son of Arthur Deck, qualified as a chemist in 1899, practising in Cambridge until he died in 1959 (Cambridge Daily News, May 25th 1959). His shop was at Regent Street, Cambridge, his brother A. A. Deck carrying on the business at 9 King's Parade (see fig. 1). It is interesting that these shops continue as chemists to the present day (see fig. 2), both being run by a family named Peck, who seem also to have been active in Cambridge from at least as early as 1854, when they were listed as local agents for certain proprietary medicines in the Cambridge Chronicle. By the time Reginald Deck died in 1959 there had been three generations of Decks who were chemists in Cambridge.

In answer to the original enquiry (GCG 1 (9) p. 455) about the annotation of a copy of "A new System of Mineralogy 1799) by Wm. Babington, now in the City of Plymouth Museum, the annotation cannot have been by Arthur Deck the elder who died in 1812, nor by Isaiah's son Arthur who would only have been nine years old in 1834. In fact the only member of the Deck family who is known to have had the necessary geological qualifications and reputation at that time is Isaiah Deck of Cambridge as suggested (GCG 1 (10) p. 487). Comparison of the signature of Isaiah Deck senior from the Visitors Book of the WNHAS, June 6th 1843, with that of the annotator of the Babington book might help to confirm that they were one and the same man.

ACKNOWLEDGEMENTS

I am very grateful to Hugh Torrens for his assistance and also for his contributions on Philip Deck and Alfred John Deck the family tree, the bookplate and the Bibliography. I am also indebted to Richard Chamberlaine-Brothers, archivist of the County Record Office, Warwick, who drew my attention to a photograph in "Victorian and Edwardian Cambridge" by F. A. Reeve, of Arthur Deck (Isaiah's son), standing on the doorstep of his shop at 9 King's Parade, Cambridge in 1872, and for his help with research at the County Record Office in Cambridge. Also for the help given by the staff of the Cambridgeshire Room of the Central Library, Cambridge and for their permission to reproduce photographs from their collection. Hugh Torrens also gratefully acknowledges the timely help of the West Suffolk Record Office.

Margaret Green
Warwickshire County Museum
Market Place
WARWICK

APPENDIX I

Donations by the Deck family to the Warwick Natural History and Archaeological Society, now in the collection of the Warwickshire County Museum: 1843-1848

Casts of Trilobite	G7726	(poss. Deck)
Asaphus caudatus	G2126	Mr. Deck, Cambridge (with printed label).
Calymene sp.	G1518	Mr. Deck
Calymene blumenbachi	G2107	I. Deck, F.G.S. Cambridge
Palatal tooth of Ptychodus polygyrus	G3510	Mr. Isaiah Deck
Cast of Goniatites henslowi	G2651	Mr. I. Deck, Leamington
Turitella sp. Suffolk	G3742	?Mr. L. Deck
Cast of skull of Ichthyosaurus communis	G6668	Mr. I. Deck, Leamington.
A series of fossils from the Crag of Norfolk and Suffolk	G8446 - 8455	Mrs. Isaiah Deck

APPENDIX II

Isaiah Deck (1792-1853) publications

1815	On Lithography - Monthly Mag. 40 130.
1816	On Brick Water - Monthly Mag. 42 317-8.
1817	On Yeast - Monthly Mag. 43 114.
1826	Mineral Catalogue copy BM(NH).
1831	Decay of Elm Trees - Mag. Nat. Hist. 4 152-153.
1841	A system of Geological Arrangement - Ipswich copies NUC WNHAS (see p.134).
1846	General rules for the quantitative analysis of Soils - Chemist 7 263-264 also in Franklin Inst. Jl. 14 417-419 (1847)
1848	On the occurrence of vanadium in the refinery slag of Staffordshire - Chemical Gazette 6 298.
1851	Coprolites or fossil manure - Pharmaceut. Jl. 10 499-501.
1854	Report on certain mineral lands in the island of Jamaica by Dr. Isaiah Deck. New York Copy NUC.
Not dated	Catalogue of Geological Series according to Werner with the latest additions and improvements suggested by the progress of the science arranged in portable cabinets. Ipswich copy John C. Thackray.
	Mineral Catalogue copy BM(NH)
	Encrinites moniliformis in the collection of Mr. Deck, Cambridge letterpress without illustration (single sheet) copy BM(NH).

Abbreviations

BMC	British Museum Catalogue of Printed Books
BM(NH)	British Museum (Nat. Hist.)
Boase	F. Boase 1965 Modern English Biography vol 5, p. 56.
CC	Cambridge Chronicle
GM	Gentleman's Magazine
NUC	National Union Catalogue of Printed Books
Venn	J. A. Venn 1944 Alumni Cantabrigienses Part II vol. 2, p. 268.
WNHAS	Warwickshire Natural History and Archaeological Society

RESEARCH IN PROGRESS ON GEOLOGICAL COLLECTIONS IN MUSEUMS.

BEEBY THOMPSON 1848 - 1931

The work at Northampton Museum outlined in G.C.G. 1 (2) (December 1974) pp. 40-51) has prompted further research into the life and work of Beeby Thompson whose collection forms a major part of the Northampton geological holdings. One of his major personal attributes appears to have been his thoroughness in documenting his own research resulting in a massive collection of papers, annotated maps, correspondence etc. all of which is preserved in the Northampton Central Library. I am at present cataloguing and indexing this material prior to further work. In addition to Thompson's many published works, these archives contain much unpublished information on all aspects of Northamptonshire geology as well as on many other subjects. Also, there is abundant biographical and historical information and correspondence relating to both himself and many of his contemporaries including S. S. Buckman, T. O. Bosworth, R. H. Rastall, P. F. Kendall, J. W. Tutcher etc. etc.

Thompson's geological collection itself is a valuable resource for palaeontological research and already contains many figured and cited specimens. The potential value of his collection is made even greater by the detailed location and stratigraphic information which is scattered throughout his archives. A major task will be to correlate this information with the specimens and once this is achieved the resultant standard of documentation for Thompson's collection will be of the highest order. A catalogue of this collection will then be prepared for publication.

Although this research is not far advanced at this stage, I will gladly receive any enquiries relating to Thompson and his collections and will be particularly pleased to hear of any material relevant to this work which may have been encountered in museum records.

John A. Cooper
Leicestershire Museums
96 New Walk
Leicester

JURASSIC MARINE CROCODILES

My research is centred on those crocodiles belonging to the Leeds Collection, which are, for the most part, housed in the British Museum (Nat. Hist.), Hunterian Museum, Glasgow, and the National Museum of Wales, Cardiff. These crocodiles are Callovian in age, and are found within the Lower Oxford Clay of the Peterborough area.

Various subsidiary material, housed in provincial museums, (and occurring in Callovian strata throughout England) is being correlated with the Leeds Collection, particularly some items from the Phillips Collection, housed in Peterborough Museum.

The nature of the research involves

a) taxonomic problems, relating to Andrews work (A descriptive catalogue of the Marine Reptiles of the Oxford Clay, Volume II) 1913

b) phylogenetic aspects, involving study of Bathonian and Liassic faunas

c) stratigraphic and geographic distribution of the crocodiles, in relation to other elements of the contemporaneous marine reptile fauna

d) environmental reconstructions, relating to crocodilian ecology, involving detailed analysis of the micropalaeontology, invertebrate palaeontology and sedimentology of the matrix sediments.

Susan M. Tresman, B.Sc.,F.G.S.

Supervisors: Prof. C. B. Cox (King's College)
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N.E.R.C. Studentship 1977-1980
GT4/77/GS/72

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THE HISTORY OF THE GEOLOGY DEPARTMENT OF THE YORKSHIRE MUSEUM

The following geologists have been on the staff, either in a paid or honorary capacity - John Phillips, John Graham, William Hatfield, Edward Charlesworth, William Proctor, William Reed, W. S. Dallas, W. Gray, Tempest Anderson, W. H. Hudleston, J. C. Purves, W. Keeping, H. M. Platnauer, J. F. Walker, W. Johnston, Sir. C. Strickland, Sydney Melmore, C. E. N. Bromehead and Uday Bagwe. I would like to hear from anyone who can offer or is seeking information on any of these, also donations to the Museum. I am also interested in the relationship of the Yorkshire Museum to other museums and institutions (both the British Association for the Advancement of Science and the Museums Association were initiated here), and to religious and secular movements, particularly in the 19th century. This research is registered with the Department of Museum Studies, Leicester University, for a post-graduate degree.

Barbara Pyrah
Keeper of Geology
Yorkshire Museum
Museum Gardens, York

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TECHNICAL

FIBRE OPTICS AND FOOT OPERATED MICROSCOPE CONTROL EQUIPMENT TO ASSIST IN THE PREPARATION OF FOSSILS

Abstract

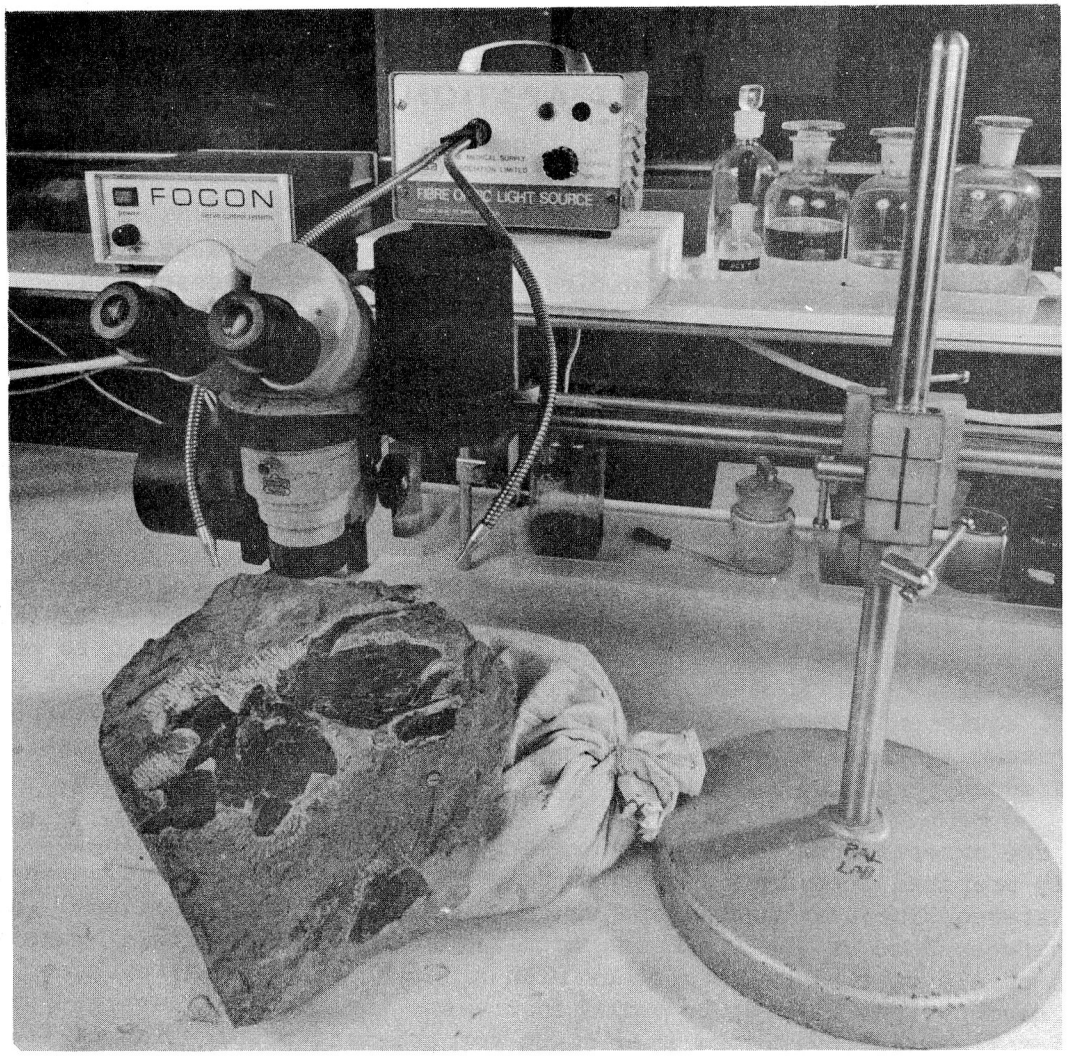
The use of fibre optic lighting and newly developed equipment for the remote control of focus and zoom of a stereo binocular microscope is described.

Advances in the techniques used to prepare fossils are now rare. Acetic acid preparation (Toombs 1948; Rixon 1968) is now an established method for removing matrices that may have only a minimal amount of calcium carbonate present. The use of thioglycollic acid (Howie 1974) will need time and expertise to gain an equal acceptance. When chemical methods fail, mechanical techniques must be resorted to and the equipment used here has invariably been that developed for dental technology. The Airbrasive equipment (Stucker 1961), variations on engraving tool design such as the Parrington hammer and pneumatic tools (Riggs 1903), diamond burrs and wheels (Rixon 1963) are all or in part used to prepare fossils mechanically. So that these techniques and tools may be better used, additional equipment has recently been purchased by the Palaeontology Laboratory, British Museum (Natural History), that now enables preparation to proceed with greater accuracy, control and comfort than has thitherto been possible.

With the exception of large vertebrate fossils, both the cleaning of chemically prepared specimens and those to be mechanically prepared demands the use of a stereo binocular microscope equipped with zoom magnification. As the contact between bone or shell and the matrix must always be visible, magnifications in excess of x10 must be used together with an appropriate light source. Although this may seem obvious it must be noted that every light source supplied with a stereo microscope is invariably inadequate for critical preparation of fossils.

First, the light source is almost always attached to the microscope thereby limiting the area around the objective available to manipulate tools and the specimen. Second, those light sources using tungsten bulbs produce enough heat to burn hands or soften the hardener or support material e.g. polyethylene glycol wax, used on the fossil. Further, at high magnifications the yellow light given out by a tungsten bulb may fail to contrast the fossil and matrix boundary; thus creating an additional strain on the preparator.

To overcome these problems a 'cold light' source (text-fig. 1) has been purchased that is entirely separated from the microscope. A quartz halogen bulb, fan cooled, supplies 100 watts of white light that is conveyed to any position around the microscope objective by two 50 cm long flexible glass fibre optics, 4 mm in diameter. Although this usage is not new for palaeontological preparation, advances in the technology of glas fibre optics means that the equipment is more compact and functional than that suggested by Macadie (1966). The immediate advantage to be gained from this equipment is that hands are not burnt, and positioning of the flexible light sources does not block manipulation of the specimen or the tools used for preparation. Further, as two light sources are available, 'high lighting' of the fossil can be accomplished using one source, with the other fibre optic used to illuminate the area to be prepared.



TEXT FIG. I

In conjunction with the fibre optic illumination a foot operated focussing and zoom control (text-fig. 1) for the stereo binocular microscope is now used. During critical preparation of specimens at high magnification much time and effort is wasted by having to constantly alter the focus or zoom control by hand so that areas requiring preparation can be orientated to the tool being used. This entails placing the specimen on the bench, adjusting the microscope and then attempting to relocate, having guessed the correct focus, the area to be prepared. This task can now be accomplished without the specimen leaving the preparator's hands. Small electrical servo motors are attached to the focus and zoom controls on the head of the microscope and are set into motion by the operation of foot switches. One servo motor is simply coupled horizontally to the focus control knob while the other, mounted vertically, alters the zoom magnification by means of a belt drive. The microscope currently used is a Nikon, however, the motors can also be attached to the Wild range of stereo microscopes. The speed at which the motors operate focus or zoom can be adjusted by a knob on the control panel that controls the power supply to the motors. The space utilised by these motors on the microscope head is minimal and does not interfere with either the specimen or the tools being used. Modifications to the microscope are unnecessary, merely four holes are tapped into the rack and pinion block so that the servo motor brackets can be attached using grub screws.

The only disadvantage to both the fibre optic system and the motorised microscope control being purchased for a preparation laboratory is cost. The fibre optic system cost £200 in 1977 and the control system £450 in 1978. However, this consideration is minimal compared with a lessening of the strain that the preparation of critical areas of fossils at high magnifications demands.

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Peter J. Whybrow
Palaeontology Department
British Museum (Natural History)

PUBLICATIONS AND LISTS.

ABERDEEN UNIVERSITY

The first two numbers of this occasional publication are now available on request from the Department of Geology and Mineralogy, Marischal College, Aberdeen AB9 1AS, Scotland. A contribution of 50p would be appreciated to help cover binding and distribution costs.

The contents are as follows:

Number 1

BENTON, M. J. and TREWIN, N. H. 1978. Discussion and comments on Nicholson's 1872 Manuscript 'Contributions to the study of Errant Annelides of the Older Palaeozoic rocks'. Publs. Dep. Geol. Miner. Univ. Aberdeen, No. 1, 1-16, pl. 1-3.

NICHOLSON, H. A. 1978. Contributions to the study of Errant Annelides of the Old Older Palaeozoic rocks. Publs. Dep. Geol. Miner. Univ. Aberdeen, No. 1, 17-47, pl. 1-6.

This is the full text and figures of Nicholson's 1872 manuscript submitted to the Royal Society but only published in abstract form in 1873. The specimens used by Nicholson and illustrated in the manuscript were recently discovered in the Aberdeen palaeontology collection. Nicholson's interpretation of the trace fossils is discussed in the first part of Number 1, and some are reinterpreted in the light of more recent studies.

Number 2

BENTON, M. J. and TREWIN, N. H. 1978. Catalogue of the type and figured material in the Palaeontology Collection, University of Aberdeen, with notes on the H. A. Nicholson collection. Publs. Dep. Geol. Miner. Univ. Aberdeen, No. 2, 1-28.

A recent survey of the above collection led to the identification, with varying degrees of certainty, of the type material of some 60 species and over 450 figured specimens. The best represented are the Coelenterata and Bryozoa most of which were originally described by H. A. Nicholson. Since this is the first catalogue to be produced for this collection the authors would welcome any information on errors or omissions so that the work can be kept up to date.

IRISH LOCAL MUSEUMS AND SOCIETIES.

Miss Norah McMillan of Merseyside County Museum has kindly drawn to our attention the "Directory of Local Museums and Local Societies in Ireland" compiled by the Executive Board of the Irish National Committee of ICOM. 1975/6.

This is the first comprehensive directory of Irish local museums and societies.

GEOLOGICAL DIRECTORY OF THE BRITISH ISLES.

This was published by the Geological Society in May 1978. The directory identifies the rich and varied geological resources in the British Isles and includes details of associations, societies, government departments, universities and other academic institutions, industrial and commercial establishments, museums, publishers and libraries relating to geology.

Geology is interpreted broadly to include regional geology, stratigraphy, palaeontology, mineralogy, geochemistry, crystallography, structural geology, applied geology, mining, geophysics, hydrology, glaciology, oceanography, geomorphology, soil science and the history of geology.

The directory is concerned with collections of printed material, the provision of enquiry services as well as details of meetings and publications.

The directory is arranged in three sections: Section 1 is a Geographical Index which lists all the organisations included in the directory by town. Section 2 is the Directory of Organisations which gives full details of the organisations. Section 3 is a Name Index.

The directory which was compiled by the Geological Information Group and edited by Judith A. Diment, is available from the Geological Society, price £3.00.

GEOLOGICAL COLLECTIONS AT CASTLE MUSEUM NORWICH

P. J. Lawrance, Assistant Keeper of Natural History at the Castle Museum Norwich has recently compiled a list of the geological collections housed there up to January 1st 1978. This is based on information from the donors and subject indexes.

EDUCATIONAL SERVICES IN GEOLOGY

The June issue of "GEOLOGY teaching" contains the section on Museums: Educational Services in Geology.

Andrew Mathieson, of City of Bristol Museum thanks all GCG members who completed the questionnaires that were used to gather the information in the catalogue. Copies of the Journal can be obtained from D. B. Thompson, Education Dept., Keele University, Keele, Staffs. at £1.50 each.

APPEAL

John Thackray of the Institute of Geological Sciences, Exhibition Road, LONDON, SW7 has been collecting information about the publication of single prints, engravings and lithographs on geological subjects. These ephemeral publications are too often ignored but are of importance for many reasons. Since many of them are of fossils they can be of taxonomic significance - for example some of the earliest Bumastid trilobites were described in this way (1827). They can also be of great significance in tracing particular specimens - for example the etching of a specimen of Pentacrinites briareus mentioned in an earlier article on Bath Museum (G.C.G. 1 no. 3, p. 105) has now been traced by John and will hopefully allow the actual specimen to be traced in the Bath collections if it survives.

John would be grateful for information about any geological or palaeontological prints or engravings, lithographs etc. in your collections and offers help in return in identifying and dating them.

SUPPLEMENT

INTERNAL CONVENTIONS USED WITH THE IRGMA GEOLOGY AND MINERAL SPECIMEN CARDS IN THE DOCUMENTATION OF THE GEOLOGY COLLECTIONS OF TYNE AND WEAR COUNTY COUNCIL MUSEUMS.

In the following account a basic knowledge of the IRGMA recording system and card format is assumed. The aim of this article is to provide a basis for comparison, criticism and improvement by other museum workers either already using or contemplating the use of the IRGMA system. Experience within Tyne and Wear County Council Museums has shown that it is essential to adopt a rigorous system of internal conventions, preferably before the completion of many cards, to gain maximum efficiency from the system as an index and to facilitate subsequent computerisation and recall of the recorded data.

The IRGMA system was adopted by the County Museums Service in February 1976 with the Geology Record Card being used originally for cataloguing fossils, rocks and minerals. In February 1978 it was decided to adopt the Mineral Specimen Card to theoretically allow more comprehensive descriptions of mineral specimens.

The adoption and initial use of the Mineral Specimen Card coupled with the prospect of a pilot M. D. A. computer project on the Permian fish collection revealed numerous inadequacies in our use of the IRGMA system and we realised our grave mistake in neglecting to standardise our recording techniques and conventions at an early stage. The result was hundreds of completed cards with inconsistent records, due to different people interpreting the instructions in widely differing ways. However it must be stated that the card instructions issued by the M. D. A. are not definitive and serve only for general guidance - or as in our case (and probably many others) misguidance! Considerable variation was also shown by individuals in recording information over a period of several months and from discussions with other card users it is apparent that data recording standards vary greatly between museums. Thus it became obvious that compilation of a standard reference of internal conventions was vital to the success of the IRGMA system and the following conventions and systematics are the results of such an undertaking.

This standard reference provides a flexible and not a finite system and the lists of examples presented have been selected to serve as an overall guide and are in no way exhaustive. It is designed for use in museums with or without geological expertise. It is envisaged that universities and similar establishments with specialised research requirements may need comprehensive retrieval/descriptive terms of a more technical nature than presented here.

For the purpose of this article the convention format has been abridged. In practice complete instructions exist for sedimentary rocks; metamorphic rocks; igneous rocks; volcaniclastic rocks; fossils, and minerals, thus providing all conventions relevant to each category in one entity.

CONVENTIONS AND ADDITIONAL NOTES FOR GUIDANCE IN THE COMPLETION OF THE GEOLOGY RECORD CARD FOR ROCK SPECIMENS

IDENTIFICATION

Institution : identity number

Example TWCMS : C1010

Simple name

This consists of one of the following statements:-

sedimentary rock
metamorphic rock
igneous rock
volcaniclastic rock
meteorite
tektite

sedimentary rock & mineral
metamorphic rock & mineral
igneous rock & mineral
volcaniclastic rock & mineral

sedimentary rock & structure
metamorphic rock & structure
igneous rock & structure
volcaniclastic rock & structure

sedimentary rock & metamorphic rock
sedimentary rock & igneous rock
sedimentary rock & volcaniclastic rock
metamorphic rock & igneous rock
metamorphic rock & volcaniclastic rock
igneous rock & volcaniclastic rock

igneous suite - used in conjunction with the Part box

All words are always in the singular and in lower case

Where the rock and associated minerals are of equal status a Mineral Specimen Card is completed in addition to the Geology Record Card.

With a composite rock specimen the ordering of the simple names does not indicate dominance of any one rock type.

General terms such as igneous rock and metamorphic rock have been used to provide a primary index for sorting, bearing in mind that the cards often have to be used by curatorial staff with minimal or no geological knowledge.

The term structure has been included to allow recall of specimens collected for their characteristic sedimentary or tectonic structural features.

Form

hand specimen
block
core

slab
thin section
acetate peel

Number

The number refers to the total number of individual specimens and can also refer to a specimen in several pieces, in which case the supplementary statement "specimen in three pieces" etc must be included in the Notes section. This is to give an immediate indication of the number of specimens bearing the same number to ensure that no specimen is overlooked.

Classified identification or full name

In all classifications we have avoided using terms implying mode of origin e.g. plutonic, extrusive, deltaic, flysch etc. Such information may be recorded in the Stratigraphy or Stratigraphy detail section.

Alphabetical listings of the common sedimentary, metamorphic, igneous and volcaniclastic rocks and relevant structures are appended, along with the major descriptive terms used to qualify the rock name in this section, (Appendices I-V). All these are keywords.

Some igneous and metamorphic rocks are characterised by particular minerals, in which case the relevant mineral keyword name or names are linked to the rock keyword name by keyword separators. The descriptive keyword terms are also linked to the rock name by keyword separators and follow any mineral keyword qualifier. This allows recall of information under several headings, i.e.

Limestone or Foraminiferal Limestone
Schist or Garnet Schist or Garnet Mica Schist
Basalt or Olivine Basalt or Amygdaloidal Olivine Basalt

See list below for Classified identification presentation.

Sublist separators are used for associated structures, minerals and other rocks.

Each term must begin with the first letter in upper case.

Examples

Simple name	Classified identification or full name
sedimentary rock	Limestone & Foraminiferal
" "	Limestone & Oolitic; Siltstone & Bituminous
sedimentary rock & mineral	Chalk; Flint
sedimentary rock & structure	Coal; Slickenside
sedimentary rock & metamorphic rock	Greywacke; Slate
sedimentary rock & igneous rock	Sandstone & Felspathic; Dolerite

Simple name	Classified identification or full name
metamorphic rock	Schist & Garnet & Mica
" "	Spotted slate
metamorphic rock & mineral	Schist; Fuchsite
metamorphic rock & structure	Banded gneiss; Flow fold
metamorphic rock & igneous rock	Slate; Dolerite
igneous rock	Basalt & Olivine & Amygdaloidal
" "	Adamellite & Porphyritic
" "	Monzonite & Quartz
igneous rock & mineral	Gabbro; Chromite
igneous rock & structure	Troctolite; Layering
igneous rock & metamorphic rock	Granite; Hornfels
* igneous suite	
volcaniclastic rock	Agglomerate & Andesitic
" "	Peperite
volcaniclastic rock & structure	Tuff; Cross bedding
volcaniclastic rock & sedimentary rock	Tuff & Crystal; Mudstone
volcaniclastic rock & metamorphic rock	Ignimbrite; Marble
tektite	Tektite
meteorite	Stone achondrite
"	Stone chondrite
"	Stony iron
"	Iron

* This is used in conjunction with the Part box for specimens from the same igneous association/complex, e.g. a composite igneous body.

Current)
Label) The relevant terms to be deleted.
Other) Note that both Current and Label can apply.

Status.

figured
described
cited
figured & described

Identifier : date

This section may be left blank when the Identifier and the Recorder are the same.

Collection.

Place names/detail

All geographical names represent keywords and are separated by ampersands.
The country of origin is stated only when the specimen is from abroad.
Any detail is included in brackets and may be descriptive
e.g. (quarry) or qualifying a geographical location e.g.
(adjacent to railway line).
When the place name or locality is a quarry, mine etc., its condition must always be stated in the Locality detail section - working, disused, overgrown etc. together with the date of observation recorded as detail.

Examples of Place name detail conventions:-

(road cutting)	(100m. south of Red Lion P.H.)
(west face)	(borehole)
(north side)	(quarry)
(cliff)	(brick pit)
(wave cut platform)	(stream section)

Additional detail may be added in the Locality detail section.

Examples of Place name statements:-

Middridge Quarry (adjacent to railway) & Middridge & Durham
High Moorsley & Pittington (roadside exposure) & Tyne Wear
Seaham Colliery & Seaham & Durham
Redburn Mine & Rookhope & Weardale & Durham
Altenau & Harz Mountains & Germany
Haddo Basic Complex & Aucheoly & Aberdeenshire

Map references

All National Grid references are given to six figures and the numerical notation is used to designate the relevant 100km square, e.g. (45) 241257.

Examples of Stratigraphy keyword/detail

~~Lat Long~~	Other co-ordinates	value & units/accuracy	Altitude
NGR		(45) 387599	Depth

~~Complex~~	~~Zone~~	Stratigraphy keyword/detail
Rock	~~Age~~	Concretionary Limestone
Complex	~~Zone~~	
~~Rock~~	~~Age~~	Magnesian Limestone (Upper)
~~Complex~~	~~Zone~~	
~~Rock~~	Age	Permian (Upper) & EZ2

~~Complex~~	~~Zone~~	Stratigraphy keyword/detail
Rock	~~Age~~	Easington Raised Beach
Complex	~~Zone~~	
~~Rock~~	~~Age~~	? Eemian
~~Complex~~	~~Zone~~	
~~Rock~~	Age	Pleistocene (Upper)

~~Complex~~	~~Zone~~	Stratigraphy keyword/detail
Rock	~~Age~~	Alum Shale
~~Complex~~	Zone	Bifrons Zone
~~Rock~~	~~Age~~	
~~Complex~~	~~Zone~~	Jurassic (Lower) & Toarcian
~~Rock~~	Age	

~~Complex~~	~~Zone~~	Stratigraphy keyword/detail
Rock	~~Age~~	Ring Dyke
Complex	~~Zone~~	
~~Rock~~	~~Age~~	Central Intrusion Complex
~~Complex~~	~~Zone~~	
~~Rock~~	Age	Tertiary

Stratigraphy detail

Examples:- An irregular deposit occurring between Marl Slate and the underlying Coal Measures.
40cm above the base of the Marl Slate
10cm from contact with phyllite
from metamorphic aureole around granite
from xenolith in gabbro
second lava flow above Lias Sandstones
Dyke

Locality detail

Examples:- actively working the Marl Slate (August 1977)
disused quarry (June 1968)
7m below ground level
south face of disused and overgrown quarry (May 1978)
quarry partially filled (February 1966)

Collection Method

in situ	loose
quarry spoil	loose & unlocalised
colliery spoil	unlocalised
mine spoil	loose (beach)
scree	borehole
talus	

Collector : date

Pettigrew, T.H. & Holden, J. : 6 August 1977

Pettigrew, T.H.:10 August 1977

ACQUISITION

Acquisition method

gift	loan
bequest	purchase
exchange	purchase (grant aid)
field collection	transfer

Acquired from : date

Examples:- Fish, W. (12, Upper Walk, Sunderland) : 1940
Hancock Museum (Newcastle) : 1904
TWCMS (Shipley Art Gallery) : 12 December 1977
Trustees & Edward Backhouse Collection : 2 January 1907
Old, J.M., Dr.

In cases where specimens have a complex acquisition history the following format has been adopted.

ACQUISITION	Acquisition method	Acquired from : date			
C	gift (to Saltwell Towers Museum, Gateshead)	Lightley,J.Mrs (The Villa,New Brancepeth, Co Durham): 2 January 1937	D Price	Conditions D Yes/No	Valuation : date D

NOTES	Notes
C	Specimen in two halves Transfer history: Transferred from Saltwell Towers Museum to the Shipley Art Gallery, Gateshead in 1969. Transferred from the Shipley Art Gallery to Sunderland Museum in September 1975.

DESCRIPTION

Condition keyword/detail

Keywords:-	poor	fair	good excellent
	weathered		unweathered
	unconsolidated		

detail:-
(worn)
(damaged)
(scratched)
(friable)
(fragile)

Examples:-
poor & weathered
poor & weathered (worn)
good (scratched)

Completeness keyword/detail

This section is not applicable to rock specimens.

Dimension measured	value & units/accuracy
phenocryst length	2.5 cm
vesicle size	0.2 = 1.0 cm
core diameter	3 cm
core length	12 cm
oolith diameter	0.5 mm = 2.0 mm
ripple amplitude	2.5 cm
etc	

Part : aspect : description keyword/detail

An alphabetical listing of the terms used in this section is given in Appendix VI.

Examples

whole : fracture : conchoidal
clasts : composition : quartz & shells
sand grains : shape : well rounded
cement : composition : calcite
whole : bedding : laminated
whole : sorting : poor

whole : texture: granoblastic
whole : composition : lawsonite & pumpellyite & prehnite
whole : features : cleavage & bedding

whole : texture : ophitic
whole : texture : holocrystalline
phenocrysts : shape : euhedral = subhedral
whole : alteration : saussuritised
layer : composition : chromite & pyroxene & plagioclase
plagioclase felspar : composition : zoned & normal

whole : texture : eutaxitic
clasts : composition : shards & lapilli & lithic fragments
clasts : orientation : imbricated
crystals : composition : plagioclase

Occasionally the descriptive information cannot be condensed in the abbreviated format, in which case it is written in full and bracketed.

PROCESS

Conservation	repaired (glue unspecified) : unknown : 1930
	consolidated (varnish unspecified) :: 1924
	consolidated (PVA emulsion) : Yates, G. :February 1977
	repaired (Durofix): Pettigrew, T. H. : 12August 1976

Other process

preparation	mechanical (cut and polished):unknown
"	mechanical (cut): Holden, J. : January 1978
"	acetate peel: Pettigrew, T. H. :February 1976:4 peels
"	stained (Chayes)
"	thin sectioned: Pettigrew, T. H. :May 1977: 3 sections
photography	black and white (FP4):Howard, P. :January 1978
"	transparency (Agfa C18) ::: 3 slides
"	colour print (Fujicolour):TWCC(Reprographic Dept): January 1978: 7 negatives

NOTES

This section is used for recording specimen transfer history and for additional data which cannot be easily recorded elsewhere on the card.

Examples:-

specimen in three pieces
Originally labelled Andesite
Originally labelled Missile Shale
Old accession number probably wrong, possibly should be 109'1961

It is desirable that old accession numbers be recorded separately to allow easy retrieval. Accordingly part of the Notes section is ruled off to produce an extra recording box.

CONVENTIONS AND ADDITIONAL NOTES FOR GUIDANCE IN THE COMPLETION OF THE GEOLOGY CARD FOR PALAEONTOLOGICAL SPECIMENS

Additional notes and conventions are given only for the sections which require a different approach for recording palaeontological information.

IDENTIFICATION

Simple name

This consists of the word fossil linked to a group name by a keyword separator. This group name has been selected for its simplicity to allow easy retrieval of information by people other than geologists.

All words are always in the singular and in lower case.

Classified identification or full name

A minimal taxonomic classification has been adopted to facilitate the inclusion of many groups and species which may occur on a single specimen. The author has been omitted for the same reason. If the specimen is a type the author is cited in the Identifier section.

Examples

Simple name	Classified identification or full name
fossil & foraminifera	Protozoa Agathammina pusilla
" & radiolaria	Protozoa Theodiscus hastatus
" & sponge	Porifera Ischadites linsdtroemi
" & coral	Coelenterata Rugosa Calophyllum donatianum
" & "	" Heterocorallia Heterophylloides sp.
" & "	" Scleractinia Tiaradendron sp.
" & "	" Tabulata Favosites gothlandicus
" & bryozoan	Bryozoa Fenestella retiformis
" & brachiopod	Brachiopoda Inarticulata Lingula credneri
" & "	" Articulata Dielasma elongatum
" & worm	Annelida Keilorites squamosus
" & ostracod	Arthropoda Ostracoda Beyrichia kloedeni
" & trilobite	" Trilobita Paradoxides davidis
" & crab	" Malacostraca Dromilites lamarcki
" & lobster	" " Hoploparia gammaroides
" & tusk shell	Mollusca Scaphopoda Dentalium sp.
" & chiton	" Amphineura Cymatochiton loftusianus
" & bivalve	" Bivalvia Plagiostoma giganteum
" & nautiloid	" Nautiloidea Peripetoceras freieslebeni

Simple name	Classified identification or full name
fossil & ammonite	Mollusca Ammonoidea Psiloceras planorbis
" & goniatite	" Ammonoidea Gastrioceras sp.
" & belemnoid	" Belemnoidea Passaloteuthis apicicurvata
" & gastropod	" Gastropoda Pleurotomaria anglica
" & echinoid	Echinodermata Echinoidea Miocidaris sp.
" & crinoid	" Crinoidea Apiocrinites elegans
" & starfish	" Asteroidea Archastropecten crispatus
" & brittle star	" Ophiuroidea Lapworthura miltoni
" & blastoid	" Blastoidea Codaster acutus
" & cystoid	" Cystoidea Heliocrinites sp.
" & graptolite	Protochordata Graphtolithina Monograptus lobiferus
" & fish	Chordata Pisces Palaeoniscus freieslebeni
" & amphibian	" Amphibia Anthracosaurus russelli
" & reptile	" Reptilia Proterosaurus huxleyi
" & mammal	" Mammalia Equus caballus
" & dinosaur	" Dinosauria Tyrannosaurus rex
" & bird	" Aves Archaeopteryx lithographica
" & plant	Bryophyta Marchantites sp.
" & "	Pteridophyta Paracalamites kutorgai
" & "	Thallophyta Algae Algites virgatus
" & "	" Stromatolite
" & "	Spermatophyta Gymnospermae Pteridospermae Callipteris martinsi
" & "	Spermatophyta Gymnospermae Coniferales Ullmannia bronni
" & "	Spermatophyta Angiospermae Sagenopteris sp.
" & assemblage *	Bryozoa Fenestella retiformis & Acanthocladia anceps; Brachiopoda Horridonia horrida & Pterospirifer alatus & Stenoscisma sp; Mollusca Bivalvia Parallelodon striatus; Mollusca Nautiloidea Peripetoceras freieslebeni
" & trace	Diplocraterion sp.
" & problematica	Conodont Panderodus unicostatus
" & faecal pellet	Faecal pellet
" & indeterminate	? Amphibian fragment
" & fish scale	Fish scales
" & plant leaf	Isolated leaf
" & plant stem and leaf	Plant stem and leaves
" & plant cuticle	Spermatophyta Gymnospermae Coniferales Ullmannia frumentaria
" & brachiopod	Brachiopoda indet.

* Fossils belonging to the same taxonomic group are listed under the appropriate heading e.g. Bryozoa or Bivalvia. Under each of these headings the species are listed using keyword separators. These groups are linked using sublist separators.

Form

hand specimen	slide
slab	acetate peel
block	skeleton
core	artificial cast
thin section	

The terms hand specimen, slab and block are arbitary and are used in a qualitative not quantitative sense.

Number

The number refers to the total number of individual specimens e.g. 4 slabs of fossiliferous limestone, each with its own fossil assemblage. It does not refer to several fossils on a single slab.

The number can also refer to a specimen in several pieces, e.g. in two halves, in which case the supplementary statement "specimen in two halves" must be included in the Notes section. This is to give an immediate indication of the number of specimens bearing the same number to ensure that no specimen is overlooked.

The word many is typed in the Number box to indicate numerous specimens of the same species.

Status

type, holotype, etc.
cited
reidentified
figured
described
figured & described

DESCRIPTION

Completeness keyword/detail

incomplete (skull only)
incomplete (caudal fin missing)
incomplete (fragments missing)

Always state as detail if the features are present or absent to avoid ambiguity, e.g. incomplete (calyx) ✗
incomplete (calyx only) ✓

Dimension measured	value & units/accuracy
length	12 cm
umbilical diameter	4 cm
etc.	

Part : aspect : description keyword/detail

As each fossil group tends to have a specific set of descriptive terms, no attempt has been made to give a listing. However as each major group is catalogued a vocabulary of descriptive terms is assembled.

Examples

whole : preservation : compressed laterally
whole : features : skull (in part) & body (good) & tail (good) & dorsal fin & pectoral fin & ventral fin & anal fin
body scales : ornamentation : annular growth lines
whole : valve : left
whole : preservation : carbonised
dorsal fin : mineralised (in part) : galena
(branching specimen)

PROCESS

Conservation	repaired (glue unspecified) : unknown : 1930
	consolidated (varnish unspecified) :: 1924
	consolidated (PVA emulsion) :Yates, G. : February 1977
	repaired (Durofix):Pettigrew, T.H. : 12 August 1976
	consolidation (plaster of Paris)
Reproduction	cast (plaster of Paris)
	model (fibreglass) ::: size x 2

Other process

preparation	mechanical (vibrotool)
"	chemical (acetic acid)
"	disaggregation (ultrasonic vibrator)
"	mechanical (cut and polished)
"	acetate peel
photography	black and white (FP4):Howard, P. : January 1978
"	transparency (Agfa C18):::3 slides
"	colour print (Fujicolour):TWCC(Reprographic Dept.) January 1978: 7 negatives

CONVENTIONS AND ADDITIONAL NOTES FOR GUIDANCE IN THE COMPLETION OF THE MINERAL SPECIMEN CARD.

As in the palaeontological section some conventions are the same as for the rocks and consequently are not repeated here.

Species

i.e. mineral name and variety (if any)
Synonyms may be included as detail
The mineral and variety names and synonyms are underlined.

Example:-

Galena
Calcite Iceland Spar
Fluorspar & Quartz
Lamprobolite (basaltic hornblende)

Simple name

The following classification groups are used:-

nesosilicate	arsenate	molybdate
sorosilicate	arsenide	native element
cyclosilicate	bitumen	native metal
inosilicate	borate	oxide
phyllosilicate	carbonate	phosphate
tectosilicate	chloride	sulphate
silicate	fluoride	sulphide
	hydroxide	telluride
assemblage	metal alloy	tungstate
		vanadate

The simple name, assemblage, may be used when several minerals, on a single specimen, are of equal status, i.e. they are not listed in the Associated minerals and matrix box. Several simple names can be linked by keyword separators as an alternative to using the term assemblage.

When a mineral specimen is also classified as a gemstone the word gemstone is linked to the relevant simple name by a keyword separator.

e.g.	Species	Simple name
	Agate	tectosilicate & gemstone

Form

hand specimen	thin section
block	crystal
core	cut stone
slab	

Number

The number refers to the total of individual specimens, and not to the number of minerals occuring on a single specimen. The word many is typed in the Number box to indicate numerous specimens of the same species.

Associated minerals and matrix

fluorspar & Carboniferous Limestone
quartz & fluorspar & sphalerite
quartz encrusting fluorspar
dendritic pyrolusite

Collection method

As for the rocks with the addition of:-

in situ (vein)

Acquisition method

field collection	loan
gift	purchase
bequest	purchase (grant aid)
exchange	

transfer - used in conjunction with an X in the Transfer History Box and the subsequent recording of the additional information on the reverse of the card under a typed heading of Transfer History, or T.H. typed in the margin.

Part : aspect : description keyword/detail

An alphabetical listing of the terms used in this section is given in Appendix VI.

Examples

whole : crystal form : crystalline (cubes and octahedra)
whole : lustre : irridescent (peacock)
whole : fracture : conchoidal
whole : cleavage : octahedral
whole : streak : black
whole : fluorescence : green (U.V. short wave)
(quartz encrusting fluorspar)
(cavity lined with crystals of quartz, ankerite and sphalerite)
whole : habit : acicular
quartz : crystal form : $3\bar{1}\bar{2}1$ trapezohedron (left handed quartz)

Store:date

Hey number and drawer number

An alphabetical listing of the commoner minerals together with their Simple names is given in Appendix VII. This list is in no way exhaustive but provides an overall guide to the classification adopted.

In conclusion we strongly recommend that existing users of the IRGMA system examine their completed cards and use of conventions very carefully to ensure their data is of a high enough standard for subsequent computerisation.

We would refer readers to the recently published list of conventions from the Hunterian Museum in MDA INFORMATION 2 (2), p 11-17 for comparison.

Comments, criticisms and suggestions relating to the conventions presented here would be welcome and should be sent to either the MDA at Duxford or Sunderland Museum.

APPENDIX I

Common sedimentary rocks

Alluvium
Anthracite
Arkose
Asphalt

Bauxite
Bentonite
Bituminous coal
Black Band Ironstone
Boghead coal
Bone bed
Boulder clay
Breccia
Breccio-conglomerate

Calcite mudstone
Calcrete
Cannel coal
Chalk
China clay
Clay
Clay ironstone
Coal
Coking coal
Collapse breccia
Conglomerate
Cornstone

Diatomite
Diatomaceous earth
Dolomite

Fault breccia
Fire clay
Fullers earth

Gannister
Gravel
Greywacke
Grit

Ironstone

Laterite
Lignite
Limestone
Loess

Magnesian limestone
Marl
Mudstone

Ooze
Oil shale

Peat
Phosphorite

Quartzite

Radiolarite

Sand
Sandstone
Seat earth
Shale
Silcrete
Silt
Siltstone
Solution breccia

Till
Tillite
Travertine
Tufa
Turbidite

Varve clay

Common sedimentary structures

Ball structure
Ball and pillow structure
Bioturbation structure
Bounce mark
Brush mark

Channel
Chattermark
Coal ball
Concretion
Cone-in-cone
Contorted bedding
Convolute bedding
Cross bedding

Dessication crack
Drag mark
Dreikanter

Flame structure
Flaser bedding
Flute cast

Graded bedding
Groove cast

Imbrication

Load cast

Neptunian dyke
Nodule

Prod mark

Rain pit
Ripple
Ripple drift
Roll mark

Sandstone dyke
Sandstone sill
Septarian nodule
Slickenside
Slump
Slump breccia
Slump fault
Slump fold
Stalactite
Stalagmite

Tool mark

APPENDIX II

Descriptive sedimentary terms

Algal
Arenaceous
Arkosic

Banded
Bituminous
Brecciated

Calcareous
Carbonaceous
Chamositic
Colour
Concretionary
Conglomeratic
Coprolitic
Crinoidal

Diatomaceous
Dolomitic

Felspathic
Ferruginous
Foraminiferal
Fossiliferous

Glauconitic
Globigerina
Graptolitic

Haematitic

Laminated

Magnesian

Nodular

Oolitic

Pelagonitic
Phosphatic
Pisolitic
Porcellanous
Pyritic

Quartzose

Radiolarian

Shelly
Sideritic
Siliceous
Skeletal
Spicular

APPENDIX III

Common metamorphic rocks

Acid granulite
Amphibolite
Augen gneiss

Banded gneiss
Basic gneiss
Basic granulite
Buchite

Eclogite
Epidiorite
Epidotite

Gneiss
Granulite

Halleflinta
Hornblendite
Hornfels

Marble
Migmatite
Mylonite

Pelite
Phyllite

Quartzite

Schist
Serpentinite
Skarn
Slate
Soapstone
Spotted Slate

Common metamorphic structures

Boudinage

Chevron fold

Drag fold

Flow fold
Fold

Kink band

Mullion

Common igneous rocks

Adamellite
Aegirinite
Andesite
Ankaramite
Anorthosite
Aplite
Appinite

Basalt
Basanite
Bojite
Borollonite
Bronzitite

Camptonite
Carbonatite
Charnockite
Cortlandite
Crinanite

Dacite
Diabase
Dialogite
Diorite
Dolerite
Dunite

Essexite
Eucrite

Felsite
Foyaite

Gabbro
Granite
Granodiorite
Granophyre
Greisen

Harzburgite
Hornblendite

Ijolite

Kentallenite
Kenyte
Keratophyre
Kimberlite

Lamprophyre
Larvikite
Leucitophyre
Lugarite

Markfieldite
Monzonite

Nephelinite
Nordmarkite

Norite

Obsidian

Pantellarite
Peridotite
Phonolite
Picrite
Pitchstone
Plumasite
Porphyry
Pulaskite

Rhyolite

Shonkinite
Syenite

Tachylite
Teschenite
Theralite
Tonalite
Toscanite
Trachyte
Troctolite
Trondhjemite
Turjaite

Common igneous structures

Cryptic layering
Cumulative layering

Flow banding
Flow lamination
Fluxion structure

Layering

Pillow

Rhythmic layering
Ropy

Vein

Igneous descriptive terms

Amygdaloidal

Orbicular

Pegmatitic
Porphyritic

Spherulitic

Vesicular

APPENDIX V

Common volcaniclastic rocks

Agglomerate
Ash

Epiclastic volcanic breccia
Explosion breccia

Flow breccia

Ignimbrite

Lahar

Pelagonite tuff
Peperite
Pumice

Tephra
Tuff
Tuff breccia

Volcanic bomb
Volcanic breccia
Volcanic conglomerate

Common volcaniclastic structures

Ball and pillow structure

Channel
Concretion
Contorted bedding
Convolute bedding
Cross bedding

Flame structure

Graded bedding

Load cast

Ripple
Ripple drift

Slump
Slump breccia
Slump fault
Slump fold

Volcaniclastic descriptive terms

Amygdaloidal
Andesitic *

Bedded

Crystal

Lapilli
Lithic

Vesicular

Vitric

* If the rock consists predominantly of one rock type then the relevant prefix may be used.

Part : aspect : description keyword/detail. Conventions for rock and mineral specimens.

Part

cavity
cement
clast(s)
cleavage
crystal(s)

fossil

geode

layer(s)

matrix
mineral name

ooliths

pebble(s)
phenocryst(s)
porphyroblast(s)

rock name

sand grains

vug

whole

xenolith

Aspect

alteration
appearance

bedding

colour
cleavage
composition
crystal form

features
fluorescence
fossil content
fracture

grading
grain size

habit
hardness

lustre

mineralised

occurrence
orientation
ornamentation

phosphorescence
preservation

rock name

shape
sorting
streak
structure

texture

variety

Description Keyword

acicular
adamantine
aggregate
amorphous
amygdale(s)
amygdaloidal
angular
anhedral
aphanitic

banded
bedded
bipyramidal
blade(s)
bomb

botryoidal
boudinage(d)
branching
brecciated

capillary
cast
cataclastic
coarse
colour
columnar
comb
concretion(ary)
crenulation(s)
crushed

crystal(s)
crystalline
cube(s)
cubic

dendritic
desert varnish
devitrified
disseminated
dodecahedra(l)
dolomitised
dull
dreikanter
drusy

elongated
encrusted
encrusting
equigranular
euhedral
eutaxitic

fan
faulted
fibrous
fine
flow
folded
foliaceous
foliated

glassy
gneissose
good
graded
granitic
granoblastic
granophyric
graphic
granular

hexagonal
holocrystalline
honeycomb
hyaline

imbricated
indurated
intergrowth
interpenetrating
irridescent

lamellar
laminated
lapilli
layered
lenticular
lineation(s)
lithic fragment(s)

mammilated
massive
medium
metallic
microlitic
mineralised
mottled

nodular
nodule(s)
non-welded
normal

octahedra(1)
oolitic
ophitic
orthopinacoid
oscillatory

palimpsest
parataxitic
parting lineation
pearly
perlitic
pisolitic
platy
poikilitic
poikoblastic
poor
porphyritic
porphyroblastic
prismatic
pumiceous
pyramidal
pyritised

radiating
reduction spot
reniform
resinous
reversed
rhombododecahedra(1)
rhombohedra(1)
rock name
rounded
runic

saccharoidal
saussuritised
scalenohedra(1)
schistose
schlieren
scoriaceous
serpentinised
shard(s)
sheared
shell fragments
silicified
slaty
specular
spheroidal
spherulitic
spotted
stellate
strain-slip
striated
subangular
sublimate
subrounded

tabular
tarnished
tetrahedral
tetrahexahedral
tetrahexahedron
tourmalinised
trapezohedron
twinned

uralitised

variolitic
vein(ed)
vesicle(s)
vesicular
vitreous
vug

weathered
well rounded
welded

xenocryst(s)

zeolitised
zoned

/detail

Additional descriptive information may be included in brackets as detail following the descriptive keyword. e.g. (graphic granite)

Species	Simple name
Actinolite	inosilicate
Actinolite Asbestos	"
" Nephrite	"
" Jade	"
" Uralite	"
Aegerine	"
Agate	tectosilicate
Agate Moss	"
Albite	"
Allanite	sorosilicate
Alstonite	carbonate
Alunite	sulphate
Amber	bitumen
Amethyst Quartz	tectosilicate
Analcite	"
Anatase	oxide
Andalusite	nesosilicate
Andesine	tectosilicate
Anglesite	sulphate
Anhydrite	"
Ankerite	carbonate
Anorthite	tectosilicate
Antimonite	sulphide
Antimony	native metal
Apatite	phosphate
Apatite Asparagus Stone	"
Apophyllite	phyllosilicate
Aquamarine	cyclosilicate
Aragonite	carbonate
Aragonite Flos Ferri	"
Arsenopyrite	sulphide
Atacamite	chloride
Augite	inosilicate
Aventurine Quartz	tectosilicate
Axinite	cyclosilicate
Azurite	carbonate
Barytes	sulphate
Barytocalcite	carbonate
Bentonite	phyllosilicate
Beryl	cyclosilicate
Biotite	phyllosilicate
Bismuth	native metal
Boracite	borate
Borax	"
Bornite	sulphide
Brookite	oxide
Brucite	hydroxide
Calcite	carbonate
Calcite Iceland Spar	"
Calcite Dog-tooth Spar	"
Calcite Nail-head Spar	carbonate
Calcite Satin Spar	"
Cairngorm Quartz	tectosilicate
Carnallite	chloride
Cassiterite	oxide
Celestine	sulphate
Cerussite	carbonate
Chabazite	tectosilicate
Chalcedony	"
Chalcedony Carnelian	"
" Sard	"
" Prase	"
" Blood-stone	"
" Crysoprase	"
" Sardonyx	"
Chalcocite	sulphide
Chalcopyrite	"
Chert	tectosilicate
Chlorite	phyllosilicate
Chromite	oxide
Chrysoberyl	"
" Alexandrite	"
Chrysocolla	silicate
Cinnabar	sulphide
Clinozoisite	sorosilicate
Copper	native metal
Cordierite	cyclosilicate
Corundum	oxide
Corundum Ruby	"
" Sapphire	"
" Emerald	"
" Emery	"
Cottunite	chloride
Covellite	sulphide
Cryolite	fluoride
Cuprite	oxide
Diamond	native element
Diaspore	oxide
Diopside	inosilicate
Dolomite	carbonate
Enargite	sulphide
Enstatite	inosilicate
Epidote	sorosilicate
Epsomite	sulphate
Erythrite	arsenate
Famatinite	sulphide
Ferruginous Quartz	tectosilicate
Flint	"

APPENDIX VII (cont)

Species	Simple name
Fluorspar	fluoride
" Blue John	"
Franklinite	oxide
Freieslebenite	sulphide
Fuchsite	phyllosilicate
Galena	sulphide
Garnet Grossularite	nesosilicate
" Pyrope	"
" Almandine	"
" Almandine carbuncle	"
" Spessartite	"
" Andradite	"
" Uvarovite	"
Gibbsite	hydroxide
Glauconite	phyllosilicate
Glaucophane	inosilicate
Goethite	oxide
Gold	native metal
Graphite	"
Greenockite	sulphide
Gypsum	sulphate
Gypsum Alabaster	"
" Selenite	"
" Satin Spar	"
Halite	chloride
Hauyne	tectosilicate
Hausmannite	oxide
Heulandite	tectosilicate
Hedenbergite	inosilicate
Haematite	oxide
" Kidney Ore	"
" Specular Iron	"
Hemimorphite	silicate
Hornblende	inosilicate
Howlite	borate
Hypersthene	inosilicate
Idocrase	sorosilicate
Illite	phyllosilicate
Ilmenite	oxide
Jadeite	inosilicate
Jamesonite	sulphide
Jasper	tectosilicate
Jasper Ribbon	"
Kaolinite	phyllosilicate
Kyanite	nesosilicate
Labradorite	tectosilicate
Lamprobolite	inosilicate
Lazurite	tectosilicate
Lazurite Lapis Lazuli	"
Laumontite	"
Lepidolite	phyllosilicate
Leucite	tectosilicate
Limonite	oxide
Magnesite	carbonate
Magnesite Breunnerite	"
Magnetite	oxide
Malachite	carbonate
Manganite	oxide
Marcasite	sulphide
Mesolite	tectosilicate
Microcline	"
Milky Quartz	"
Millerite	sulphide
Molybdenite	"
Monazite	phosphate
Montmorillonite	phyllosilicate
Morion Quartz	tectosilicate
Mullite	nesosilicate
Muscovite	phyllosilicate
Natrolite	tectosilicate
Nepheline	"
Niccolite	arsenide
Niobite	oxide
Nosean	tectosilicate
Oligoclase	tectosilicate
Olivine	nesosilicate
Olivine Fayalite	"
" Forsterite	"
Onyx	tectosilicate
Opal	"
Opal Menilite	"
Orthoclase	"
Orthoclase Moonstone	"
Paragonite	phyllosilicate
Pectolite	inosilicate

Species	Simple name
Pentlandite	sulphide
Periclase	oxide
Perovskite	"
Phillipsite	tectosilicate
Phlogopite	phyllosilicate
Piedmontite	sorosilicate
Pigeonite	inosilicate
Pitchblende	oxide
Plagioclase	tectosilicate
Polianite	oxide
Polybasite	sulphide
Prehnite	phyllosilicate
Psilomelane	oxide
Pumpellyite	sorosilicate
Pyrite	sulphide
Pyrolusite	oxide
Pyromorphite	phosphate
Pyrophyllite	phyllosilicate
Pyrrhotite	sulphide
Quartz	tectosilicate
Realgar	sulphide
Rhodochrosite	carbonate
Rhodonite	silicate
Riebeckite	inosilicate
" Crocidolite	"
" "	
tigers eye	"
Rock Crystal Quartz	tectosilicate
Rose Quartz	"
Rutile	oxide
Scapolite	tectosilicate
Scheelite	tungstate
Scolecite	tectosilicate
Serpentine	phyllosilicate
Serpentine Antigorite	"
" Chrysotile	"
" Noble	"
" Picrolite	"
Siderite	carbonate
Sillimanite	nesosilicate
Silver	native metal
Smaltite	arsenide
Smithsonite	carbonate
Smoky Quartz	tectosilicate
Sodalite	tectosilicate

Species	Simple name
Sperrylite	arsenide
Sphalerite	sulphide
Sphene	nesosilicate
Spinel	oxide
Spodumene	silicate
Stannite	sulphide
Staurolite	nesosilicate
Stephanite	sulphide
Stilbite	tectosilicate
Strontianite	carbonate
Sulphur	native element
Sylvanite	telluride
Sylvine	chloride
Talc	phyllosilicate
Tennantite	sulphide
Tetrahedrite	sulphide
Thomsonite	tectosilicate
Thorite	silicate
Topaz	nesosilicate
Tourmaline	cyclosilicate
Tremolite	inosilicate
Trona	carbonate
Turquoise	phosphate
Vanadinite	vanadate
Vermiculite	phyllosilicate
Vivianite	phosphate
Wavellite	phosphate
Websterite	sulphate
Willemite	silicate
Witherite	carbonate
Wolfram	tungstate
Wolfram Ferberite	"
" Hubernite	"
Wollastonite	inosilicate
Wulfenite	molybdate
Zincite	oxide
Zircon	silicate
Zoisite	sorosilicate

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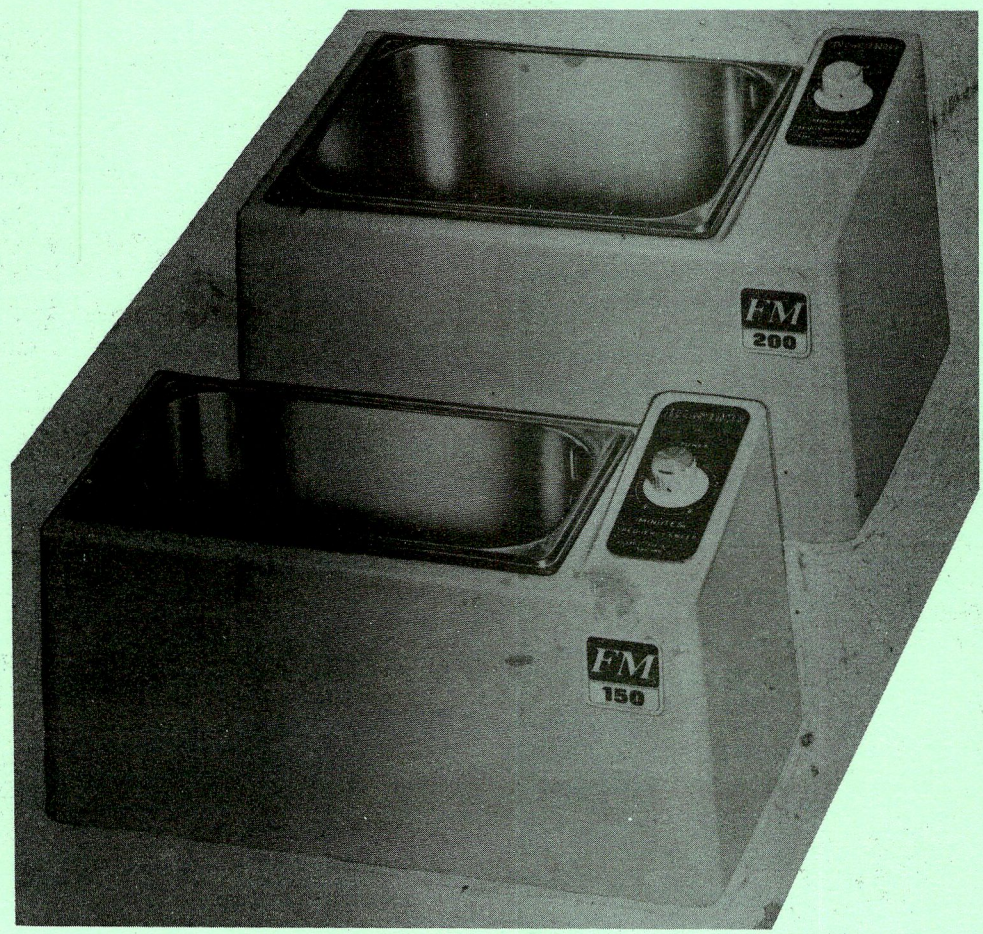

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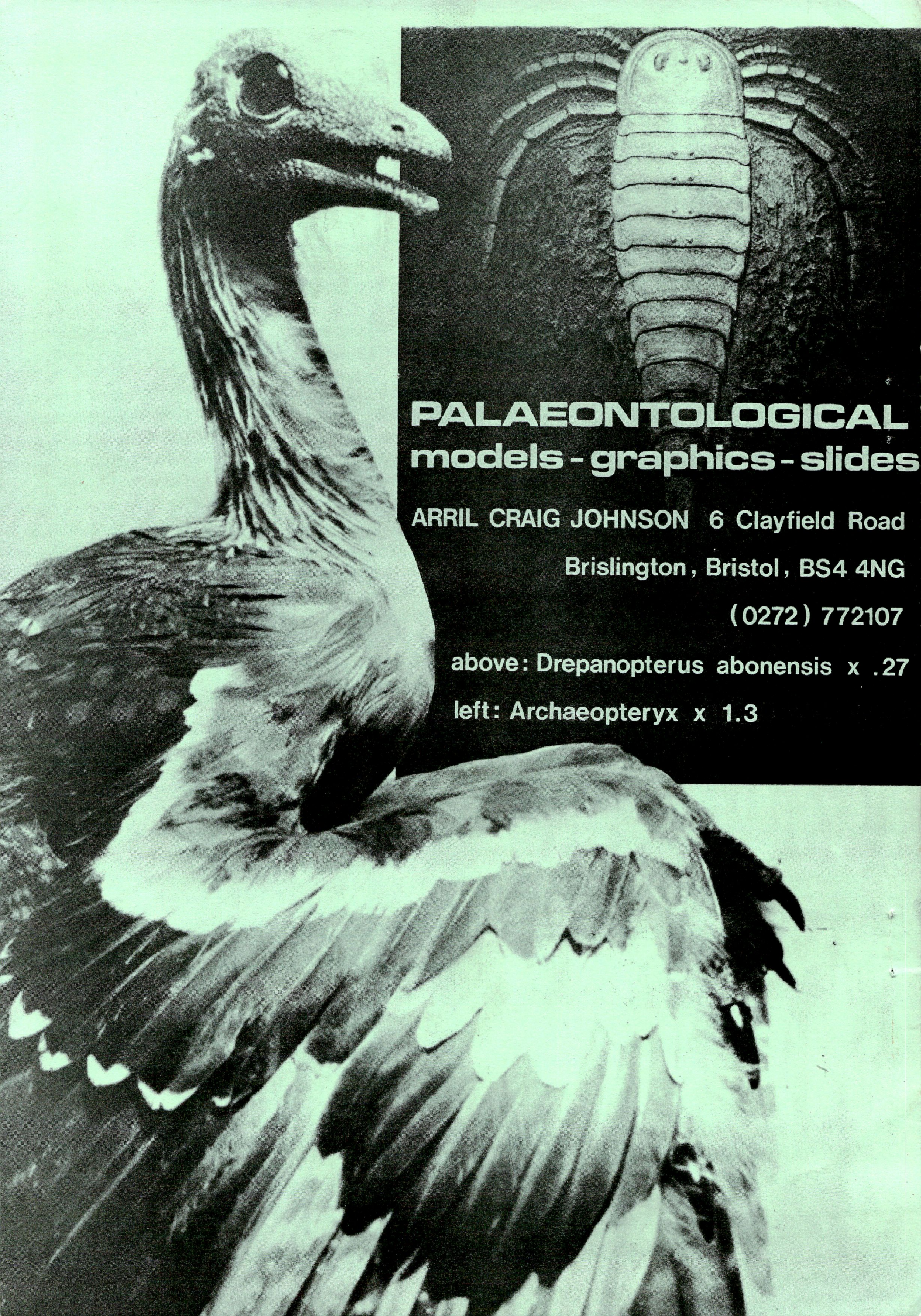

PALAEONTOLOGICAL
models - graphics - slides

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above: Drepanopterus abonensis x .27

left: Archaeopteryx x 1.3