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THE GEOLOGICAL CURATOR

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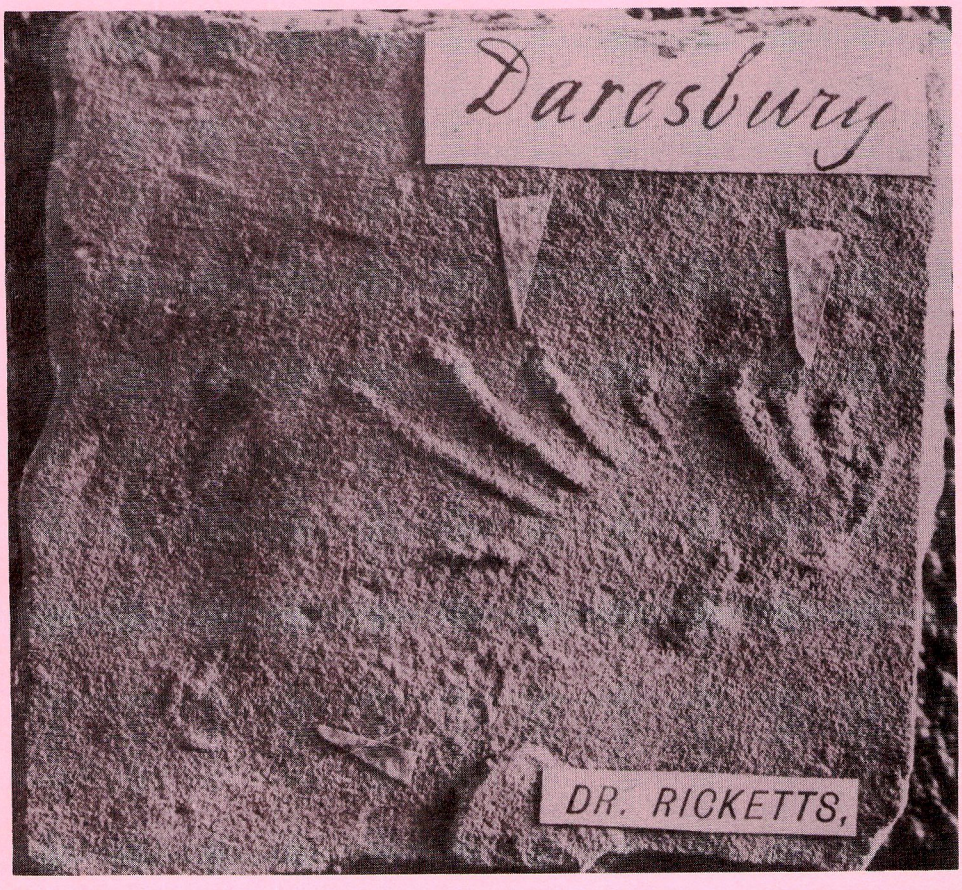

See inside W. A. S. Sarjeant on the 'track' of fossil footprints in British museums

SUBMISSION OF MSS

Three issues are published each year. The last dates for submission of copy for publication are:

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COLLECTIONS AND INFORMATION LOST AND FOUND.

All items relating to this section in the Geological Curator should be sent to:

Dr. Hugh S. Torrens, Geology Dept., University of Keele, Keele, Staffs. ST5 5BG. Tel. 0782-621111 Ext. 493.

INFORMATION SERIES ON GEOLOGICAL COLLECTION LABELS

All enquiries and items should be sent to:

Ron. Cleevely, British Museum (Natural History), Cromwell Road, London SW7 5BD. Tel. No. 01-589-6323 Ext. 418.

NOTES AND NEWS

All items relating to this section should be sent to Tony Cross, Curtis Museum, High Street, Alton, Hants GU34 1BA.

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Typed by Sylvia Robson, Tyne and Wear County Council Museums.

THE GEOLOGICAL CURATOR

Vol. 3 No. 9

CONTENTS

COVER PHOTOGRAPHS

Our Cover photographs show two specimens of fossil footprints. The upper photograph illustrates a specimen of Rhynchosauroides rectipes Maidwell, 1911. This is the holotype of the generotype and was collected by Charles Ricketts from the Keuper Sandstone (Triassic) of Daresbury Cheshire. The specimen is in the museum of the Geology Department, University of Liverpool (Acc. No. LU8019). X1.

The lower photograph illustrates a footprint of Chirotherium storetonense Morton, 1863. (Considered by Haubold (1971), to be conspecific with Chirotherium barthii Kaup, 1835.) From the Keuper Sandstone (Triassic), Storeton, Cheshire. The specimen is in the collection of Merseyside County Museums (Acc. No. 338A4, slab no. 1) X 0.6.

These photographs were provided by Prof. W.A.S. Sarjeant to introduce his article on some fossil footprints in British Museums on page 541.

EDITORIAL

COMING SOON - A NEW LOOK GEOLOGICAL CURATOR

This issue is the last for 1983 and is also the last part (No. 9) of volume 3. Volume 4 No. 1 will see a change in the inside appearance of the Geological Curator. To improve the quality and presentation the camera ready copy will be typed on an A3 sheet using a two column format. This will be reduced by the printer to our standard A4 size. This should eliminate the problem of 'faded' printing and will also enable more material to be included per issue at no extra cost. However it will also mean that virtually all contributions will have to be re-typed to conform to the new format. Since 1981 all the typing for the Geological Curator has been undertaken by Sylvia Robson of Tyne & Wear County Council Museums. Without Sylvia's expertise it would be virtually impossible to produce the Geological Curator and she has agreed to undertake the typing for the 'new look' format. I would therefore like to take this opportunity of thanking Sylvia for all her hard work and also to express our gratitude to Tyne & Wear County Council Museums for allowing Sylvia to undertake this vital service for the Group.

THE SALE OF SPECIMENS FROM MUSEUM COLLECTIONS.

Several items in this issue refer to the sale of geological specimens from the collections of local authority museums (see letter to the Editor from Alan Howell on the sale of specimens from Bolton Museum (p.561) and the article by Mike Taylor on p.538which records the recent auction by Sotheby's of the geological collections of Abingdon Museum). This has prompted other museums to start selling material from their collections. Indeed it seems to be a widespread practice and has, for example, occurred in the recent history of my employing institution where, in the 1960's, 'duplicate' specimens of North Pennine minerals were given to a dealer in exchange for a large mineral specimen wanted for display (there was no geologist on the staff at that time).

Is the disposal of material from museum collections on the open market consistant with the ethical, moral and legal responsibilities of a museum?

The Code of Practice for Museum Authorities (published by the Museums Association in the Museums Yearbook 1983 (pp. 5-7) states (in section 5 Disposal of Collections) that "The definition of a museum .... makes it clear

that it (has) a key function .... to acquire objects .... and to keep them for posterity. Consequently there must be a strong presumption against disposal of any items in the collections of a museum".

The code goes on to say;

"So far as local authority and private trust museums and galleries are concerned, attention is drawn to the important advice on the legal position included in the Report of the Committee of enquiry into the Sale or Works of Art by Public Bodies (HMSO 1964).

'30 The basic principle upon which the law rests is that when private persons give property for public purposes the Crown undertakes to see that it is devoted to the purposes intended by the donor and to no others. When a work of art is given to a museum .... the public thereby acquires rights in the object concerned and these rights cannot be set aside. The authorities of the museum are not the owners of such an object .... they are merely responsible under the authority of the Courts, for carrying out the intentions of the donor. They cannot sell the object unless authorised to do so by the Courts, Charity Commissioners or the Minister of Education on behalf of the Courts.'"

Presumably this principle of law is equally valid when considering the disposal of other museum objects as well as works of art. Obviously, under certain circumstances, museums may have to dispose of material e.g. where collections cannot be properly accommodated or where there is no qualified member of staff to curate them or if a museum is forced to close through lack of finance. However, the Museums Association Code is quite unequivocal in its recommendations in such circumstances:

".... Any decision to sell or dispose of material from the collections should be taken only after due consideration and such material should be offered first, by exchange, gift, or private treaty sale, to other museums before sale by public auction is considered."

In other words sale on the open market where there are no safeguards for the future preservation of the objects should only be considered as a last resort.

From the above extracts it follows that the uncontrolled sale of collections by museum authorities is at best irresponsible and at the worst downright illegal. Another great hazard in such random disposal is that vital documentation and archival material relating to a collection is, by oversight or ignorance, *not* included in the sale thus resulting in separation of the two.

I would suggest that as a Group, perhaps the only organisation in Britain *solely* concerned with our geological heritage, we should actively discourage with all the means at our disposal any museum authority contemplating the unrestricted sale of its geological collections. Perhaps members have different views to the above. Please write if you do - contributions on this topic will be published in subsequent issues of the Geological Curator.

FORTHCOMING MEETINGS & EXHIBITIONS

GEOLOGICAL CURATORS' GROUP 10th ANNIVERSARY MEETING

Wednesday 15th February 1984 at New Walk Museum, Leicester

Provisional Programme

10.45 Assemble, coffee

11.00 Exhibition planning and production: "Lost Worlds"
John Martin and Alisdair Hinshelwood

11.45 "Lost Worlds" : educational use. Chris Scotter

12.15 Tour of Leicestershire Museums Earth Sciences Section stores and laboratories

13.00 10th Anniversary lunch, Lord Mayor of Leicester's Rooms

14.15 New materials and techniques in geological model-making. Alan Dodson

15.15 "Down to Earth" : a major travelling exhibition with publication and educational package. Peter Crowther

16.00 Tea

16.15 Geological Curators' Group - the next ten years. Phil Doughty

17.00 Disperse

Friday-Saturday 8th - 9th June, 1984. Ludlow Museum (including a field trip). See stop press on page 573 for details.

***Thursday 6th September, 1984. Computerisation at the Sedgwick Museum. Local secretary Dr. D. Price.**

***Friday 7th September, 1984 Castle Museum Norwich. Topics to include conservation of Pleistocene vertebrate material and a look at the new temporary display. The Ice Age in East Anglia. Local Secretary Diana Smith.**

Friday 7th December, 1984. AGM at the National Museum of Wales, Cardiff. The theme will be storage. Local Secretary Tom Sharpe.

April 1985. Winchester (Hampshire Museum Service) Local Secretary Tony Cross.

September, 1985. Bolton Museum. - Local secretary Alan Howell.

December, 1985. Brighton Museum. - Local Secretary John Cooper.

* Cambridge and Norwich can be treated as one 2 day meeting (the two cities are in close proximity). In view of this it will be possible to arrange bed and breakfast on the Thursday night. Contact Diana Smith at Norwich Museum for details (address on inside of back cover)

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SALTHILL QUARRY GEOLOGY TRAIL EXHIBITION

A new display has been opened at Clitheroe Castle Museum featuring the recently opened Geology Trail at Salthill Quarry, Clitheroe. Salthill is one of the limestone 'reef-knolls' of the Clitheroe area and was quarried for limestone from the 17th century to 1960. The quarry, a Site of Special Scientific Interest, was landscaped and a Geology Trail constructed around the quarry faces in 1982.

The display interprets the geology to be seen on the Trail. It includes a large panoramic photograph of the quarry and many examples from the great variety of fossils that occur at Salthill. The exhibition explains that Salthill was formed in Dinantian times as a series of lime mud-banks in a warm sea when Britain was only a few hundred miles north of the equator.

The Museum will open for the 1984 season on Good Friday, April 20th and is open every day except Wednesday, 2-4.30 p.m. A guide and free leaflets about the Salthill Quarry Geology Trail are available at the Museum.

DOWN TO EARTH National Travelling

Exhibition on the subject of Soils

Introduction

Leicestershire Museums, Art Galleries and Records Service have been commissioned by the Soil Survey of England and Wales to produce a major national travelling educational exhibition to promote the understanding and importance of soil as a prime natural resource.

It will be opened on 12th March 1984 by Professor David Bellamy and travel to a number of important national venues in the succeeding two to three years.

It is in essence an "educational package" and will therefore include worksheets with the exhibition, a 48 page full colour book and a 16 page teachers' booklet on practical ways of learning about soils in the classroom and the field.

The exhibition and the book are intended to appeal to the general public.

'Down to Earth' travelling exhibition

Format: 44 free standing panels (based on 8' x 4' units) and 10 soil profiles (max. size 4'6" x 1'4"), arranged as a central 'core' of 26 panels with 4 independent 'satellites' of 3, 6, 5 and 4 panels.

Content: The 'core' stresses the importance of soil, explains its mode of formation and why there are so many different types of soil, sets out how and why soils are classified and mapped, and who uses the information.

The four satellites are concerned with

(a) Soils and Natural History (3 panels) - the diversity of soil life and how land use affects it.
(b) Soils and Farming/Gardening - how soil properties control our ability to grow plants efficiently (6 panels).
(c) Soils and Land Reclamation - the importance of soil reclamation (5 panels).
(d) Soils and Archaeology - how soils preserve evidence of man and how archaeologists obtain such evidence (4 panels).

The 10 soil profiles form an especially exciting visual element in the exhibition. This representative sample from the East Midlands was taken in conjunction with Soil Survey staff during an extensive field-programme in spring 1983. They have been prepared for display by technical staff at the international Soil Museum, Wageningen, Holland. Such soil profiles have never before been exhibited in Britain.

'Down to Earth' book

Format: 48 page, squared A4 colour illustrated.

Content: text is being written by Dr. S. Nortcliffe (Reading University), author of elementary text-books on soil science. Subject order and scope is based on the exhibition brief; most of the colour illustrations will be common to both exhibition and book. The book will stand by itself as an introductory text, independent of the exhibition (in a similar way to the various BM(NH) books which accompany their new exhibitions).

'Down to Earth' Teachers' booklet

Format: A4 B/W printed sheets.

Content: to be prepared by Field Studies Council staff at Juniper Hall Field Centre, Dorking Surrey in conjunction with the Education Section at Leicestershire Museums, and will include explanations of soil physical, chemical and biological characteristics with examples of experiments and projects that can be undertaken in the classroom and the field.

Exhibition worksheets

Format: A4 printed single sheets.

Content: to be prepared by Christopher Scotter, Museum Education Officer at Leicestershire Museums and will aim to maximise intelligent interaction with the exhibition, primarily for visiting school parties, but for use by the general public if required.

Venues:		
	Leicestershire Museums	12th March - June 1984
	The Royal Agricultural Show	July 1984
	Derbyshire Museum	Sept - Oct 1984.
	Mansfield Museum	Nov - Dec 1984
	Geological Museum, London	Jan - April 1985
	National Museum of Wales	May - August 1985
	Derby City Museum	Sept - Oct 1985
	Lincolnshire Museums	Nov - Dec 1985

Other institutions are expressing positive interest in taking the exhibition but these are the firm bookings to date.

Sponsors of the 'Down to Earth' project

Leicestershire Museums, Art Galleries and Records Service
Soil Survey of England and Wales
Agricultural Research Council
British Society of Soil Science
National Coal Board
Royal Geographical Society
Royal Agricultural Society of England

Principal personnel involved in 'Down to Earth'

Leicestershire Museums, Art Galleries and Records Service

Peter Crowther (Exhibition Co-ordinator)
Chris Scotter (Book; education; publicity)
Ted Moody (Designer)
Alan Birdsall (Graphics)
Steve Thursfield (Photographer)

Specialist advisers:

Don Mackney (Head of Survey, Soil Survey of England & Wales)
Peter Bullock (Head of Research, Soil Survey of England & Wales)
Robert Evans (Information Officer, Soil Survey of England & Wales)
Michael Saull (ex Soil and Water Management Association)
Steven Nortcliffe (Reading University: book)

If you require further information please contact:

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COLLECTORS COLLECTIONS & MUSEUMS OF NOTE
No. 42. THE GEOLOGICAL COLLECTIONS OF THE NATIONAL MUSEUM OF IRELAND

by Nigel Monaghan

The geological holdings of the National Museum of Ireland in Dublin, span almost two hundred years of collecting, and apart from important Irish material there is much of international, particularly British interest. In 1981 the Museum took on two full-time geologists, the first for almost a century, Ms. Eileen Farley (mineralogist/petrologist) and myself (as palaeontologist).

Davies (1975) has outlined some of the scope, and the fate of much of the collections. This account needs much updating as the bulk of the collections was transferred to new premises and better conditions in 1979, and since then there has been a programme of registration implemented.

The collections moved to the Royal Hospital in Kilmainham (surburban Dublin) in 1962 comprised some 300 crates (2 cu.ft.) of minerals, rocks, invertebrates, vertebrates and plants. A similar volume of material was transferred, still in drawer storage, as there had been insufficient time available for complete crating of the collections. In addition to the specimens in crates and drawers, there was a collection of icthyosaurs and plesiosaurs mounted on an upright wooden screen, and a number of large free-standing vertebrates.

All of the aforementioned material (c. 40,000 specimens) was transferred to new accommodation in 1979, and the specimens in drawers were packed into crates at that time. All of the specimens packed at that time were listed as had been the case for those crated in 1962, there is thus a complete manuscript list and card catalogue of the entire collections, which has been in existence since 1980. The 1962 lists were compiled by

Dr. J. S. Jackson (Keeper of Natural History, 1957-1968), a geologist, but with responsibilities for zoology and botany. The 1979 catalogue lists were compiled by geology undergraduates under the direction of Mr. D. Felton, a consultant geologist brought in to supervise the transfer, and retained until 1982.

The present storage of the bulk of the geological collections is in a former boys' reformatory fifty miles from Dublin. Despite the remote location, conditions of storage are quite good, and atmospheric conditions are maintained at c. 60°C and 50-55% RH, and regularly monitored. The staff is based in Dublin where about 8,000 specimens are stored, this includes the Griffith collection, all Irish invertebrates and minerals, meteorites, the plant collections, fish collections, osteological collections and sundry others, including material on display in the Natural History Museum.

The condition of the 50,000 or so specimens in the collections is generally quite good, most are intact with labels, most are dirty to a varying degree, but extremely few are victims of pyrite decay or physical damage. The style of written record and the systems of registration used in the past are varied and no uniform system of documentation has been applied. It was therefore decided at an early stage of the present work to concentrate on registration in a new computer oriented system. To date 12,000 invertebrates, 7,000 minerals, 1,000 rocks and sundry other specimens have been individually numbered and each recorded in a card catalogue as well as a permanent register.

Published catalogues of portions of the collections are no longer available and in some cases (e.g. Lyddeker, Davis) entries are not definitely referrable to specimens as no system of numbering was used. The Karsten catalogue of the Leske collection, the Jukes et al catalogues of the Museum of Irish Industry and the Giesecke catalogue of the minerals in the Museum of the Royal Dublin Society are useful texts for which many of the specimens have been located in the present registration. All other previous records were in the form of entries in the general Natural History registers, the Mineral register (including rocks), manuscript lists, labels with specimens, and the post-1957 Geological register initiated by Dr. Jackson. In all about sixty per cent of the specimens were registered in past registers, although some collections were allocated only one number.

The major collections are listed below, apart from these there are many individual donations by late nineteenth century amateur geologist members of the Royal Dublin Society, numerous Irish Pleistocene cave remains mostly from the Royal Irish Academy, and a large amount of foreign material purchased or donated by a variety of professional geologists. Purchases were made mostly in the 1870's-1890's and include numerous minerals, but mainly Tertiary and Quaternary molluscs from dealers such as F. H. Butler, J. R. Gregory, R. F. Damon, E, Charlesworth, Krantz and B. M. Wright. Of the invertebrates (the best documented group so far) Irish material forms about 20% of the total collection. Much of the foreign material is British, there is also some European (Solenhofen, Italian Pleistocene molluscs), North American (Grant invertebrate collection), Indian (Siwalik mammals) and there is a truly international collection of mineral purchases. As with the invertebrates about 20% of the minerals are Irish.

As the collections have remained out of the public view since 1922, there has been little in the way of active acquisition from that time until Jackson's Keepership in 1957. There has been obvious reluctance for geologists to part with specimens without a guarantee of easy access for later research. The post of Keeper of Minerals was abolished in 1891, and since the turn of the century research on the collections has mainly been carried out by visiting workers. Various geologists were employed on a part-time basis to reorganise sections of the collections, most notable of these was Grenville Cole (1859-1924) from 1896 until his death. Natural History Division staff have maintained the collections making material available for loan or inspection by visiting research workers.

Accommodation for the collections with adequate drawer storage is the top priority, at present material is housed in no less than five buildings, there is no laboratory and an inadequate library. Attempts have been made in the past to rectify the situation but these have been largely unsuccessful, and in the present financial climate there is little chance of any marked improvement in conditions.

Despite the somewhat gloomy long term future of the collections, work on registration is continuing and there is some gradual improvement in storage and organisation. At present plans for a travelling exhibition "Introduction to Geology" aimed at schools are under way, allowing some limelight to an otherwise closeted collection. Academic enquiries are welcomed although different collections are variably documented and access to material is sometimes difficult, any queries should be sent to the address below.

Nigel Monaghan, Geological Section, National Museum of Ireland, 7-9 Merrion Row, Dublin 2. Phone Dublin 601117.

MAJOR COLLECTIONS IN THE NATIONAL MUSEUM OF IRELAND

LESKE: Prof. of Natural History at Marburg, 7331 specimens of minerals, also rocks and fossils, purchased by the Royal Dublin Society for £1350 in 1792, catalogued by Karsten in 1793, all specimens bear distinctive labels with numbers corresponding to the catalogue, mostly Central European, very comprehensive for its time.

GRIFFITH: Sir Richard, responsible for the first geological map of Ireland (1835, published 1838), c. 3,800 specimens including 380 type and figured, Carboniferous and 'Silurian', described by M'Coy, all on display tablets and well labelled, all Irish.

FOORD: Irish cephalopods, all Carboniferous, many types and figured specimens, subject of a Pal. Soc. Monograph.

GEOLOGICAL SURVEY (U.K.): Collection of representative British fossils sent to Ireland for comparative purposes, forms 18% of invertebrate holdings.

SIWALIK: Indian Pliocene/Pleistocene, mostly donated by British Museum, originals and plaster casts, some type and figured specimens.

LIASSIC SAURIANS: The Lee collection (purchased 1868) of 34 ichthyosaurs and two plesiosaurs, two casts of B.M. plesiosaurs, and the type of Thaumatosaurus cramptoni described by Carte and Baily in 1863.

GIESECKE: Greenland and Irish minerals, well documented, catalogue in 1832.

HUXLEY: Irish Coal Measures fish and type amphibians from Jarrow, Co. Kilkenny.

M'CLINTOCK: Arctic invertebrates and some plants, some type and figured.

PLANTS: British Coal Measures, European purchased from Dr. F. Krantz, Miocene of Greenland described by Heer, 57 crates of Devonian plants from Kiltorcan, Co. Kilkenny (poorly documented).

METEORITES: As listed by Seymour (1951), notably the Irish 'Brasky' meteorite.

Other named collections include Murphy (Irish Ordovician trilobites), Everard (British Caenozoic invertebrates), Seymour (Irish rocks), Farnham (good variety of international minerals), Heidelberg (European rocks and minerals) apart from Murphy and Seymour most date from the turn of the century.

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NOTE : The catalogues by Jukes and ? Kane are numbered '2' and '3' respectively, there is a reference made by McHenry and Watts in their catalogue to a previously available fossil catalogue written by Jukes which may be number '1' of the series. Any help in tracing this catalogue would be greatly appreciated.

A NOTE ON THE BIRKBECK COLLEGE PALAEONTOLOGICAL COLLECTIONS

by K. M. Evans

As with most departmental collections, the bulk of the palaeontological specimens (teaching material and reserve collection) comprise unfigured and uncited material. One exception is a specimen of Sonninia (Papilliceras) arenata (Quenstedt) with aptychus, figured by Morton (1973, pl. 18, fig. 3), which is used for demonstrations and is stored away from the main collection.

An important acquisition in recent years had been the G.M. Davies fossil collection. George MacDonald Davies is probably best known for his guides to the London area (1914) and the Dorset Coast (1935), and in the course of his studies he made an extensive collection of rocks and fossils.

The fossil collection comprises 15 drawers, mainly of Jurassic, Cretaceous and Eocene material along with lesser numbers of Coralline Crag, Red Crag, Rhaetic and Palaeozoic specimens. The quality of the material is high and the standard of the determinations, whilst in need of revision, appears to be generally good. The documentation and curation of the collection is excellent with specimens stored in cardboard trays with full details of the horizon and locality. At the present time the collection has yet to be added to the departmental catalogue and it is intended to keep the collection intact in a separate number series rather than to disperse it amongst the reserve collection which is catalogued phylum by phylum.

One final item possibly of interest to historians concerns an edition of the S.V. Wood monograph of Crag Mollusca (1848-1874) held in the departmental library. The three volumes are bound in gold-embossed leather and the first volume includes a frontispiece signed by Richard Owen expressing the acknowledgement of the Palaeontographical Society to Searles Wood for his contributions to the Transactions of the Society and his duties as treasurer. How these special presentation volumes came to be at Birkbeck remains something of a mystery.

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ABINGDON MUSEUM FOSSIL MATERIAL TRANSFERRED TO OXFORD UNIVERSITY MUSEUM

by Mike A. Taylor

In December 1982 Abingdon Museum transferred its non-local material to the Oxford University Museum (OUM) through the good offices of the Curator, Ms. Nancy Stebbing, and of Mr. Justin Delair. The material was originally sorted by Mr. Delair and by the then Curator, Mrs. Cox, in 1979. It was registered at the OUM by the author (as a voluntary assistant) and Mr. H.P. Powell, Assistant Curator of the Geological Collections.

There are four main categories of specimens:

(1) Upper Carboniferous plants

A small collection of rather poor material. Some, at least came originally from the OUM (not yet numbered).

(2) Miscellaneous Jurassic, Cretaceous and Eocene material

This consists of invertebrate fossils except for one possible partial skull (L.449) of an unidentified vertebrate from the London Clay (Eocene) of Sheppey (OUM J.43242-J.43259, K.10570-K.10574, L.449 et seq.).

(3) Upper Pliocene/Lower Pleistocene: Red Crag Nodule Bed of East Anglia

This collection appears to be that mentioned by Newton (1891, p.2) as belonging to Frank H. Harris of Abingdon. This assumption stems from the recognition of specimen OUM Q.3434 as that described by Newton (1891, p.18) and mentioned as belonging to Mr. Harris. It is the proximal portion, with both ends damaged, of the tusk of a juvenile walrus from Foxhall, near Ipswich, Suffolk, and referred by Newton to Trichechus huxleyi Lankester. Several other specimens bear labels matching that of Q.3434, and the entire Red Crag collection has therefore been provisionally referred to Mr. Harris.

The collection (OUM Q.3433-Q.3581) includes molars of bovids, suids and equids (various species of cow, pig and horse); fragmentary teeth of Rhinoceros and the elephant Mastodon; teeth of toothed whales; ear bones of toothed and baleen whales; other unidentified teeth and bone fragments; many shark, ray and teleost (bony fish) teeth and vertebrae, and crab and lobster remains (some but not all of this fish and crustacean material is derived from the London Clay and is therefore of Eocene age); a crocodile tooth, presumably also derived from the London Clay; pedicle valves of the brachiopod Terebratula grandis; and pieces of wood.

(4) Lower Pleistocene: ?Cromer Forest Bed

Three molars of the elephant Archidiskodon meridionalis (Nesti) (OUM Q.3582-Q.3584) are presumably from the Cromer Forest Bed. One specimen is labelled "Sidestrand" (near Cromer, Norfolk; a classic exposure of the Forest Bed).

Unfortunately there are no records detailing the sources of the specimens. The original catalogue of 1935 states that the bulk of the collection was donated by Mr. John West and Dr. P. Martin, but many of Dr. Martin's fine fossils from Dorset were sold at Sotheby's by the Town Council of Abingdon in the early 1970's (Ms. N. Stebbing, Curator, in litt. 1983). See addendum.

However, the Red Crag material is presumed to be from Frank H. Harris. Some specimens (the Carboniferous plants, and a few invertebrates) also came from the OUM collections.

Reference

Newton, E.T. (1891) The Vertebrata of the Pliocene deposits of Britain. Mem. Geol. Surv. U.K.

ADDENDUM

The Abingdon Museum material from Dorset which was sold at Sotheby's is listed and in some cases illustrated in the catalogue of the sale of "minerals, meteorites, fine fossils ... and other natural history specimens" on 17th March, 1972. There were ten lots, comprising thirteen specimens in all, all from the Lower Lias of Lyme Regis. These included ichthyosaurs (one complete, one head, and one partial head with paddle), fish (one Furo, three Dapedium and one Heterolepidotus), three belemnites, and two crinoids. Only one (the only belemnite with a phragmocone) went to an institution (Aberdeen University), and the remainder presumably went to private collectors.

Michael Alan Taylor
Present Address
City of Bristol Museum and Art Gallery,
Bristol.
BS8 1RL.

The Property of the Abingdon Museum
(Sold by Order of the Town Council)

189 SHARK SPINE. A fin spine from a hydrodont shark, 12in long, in Lower Lias matrix, mounted in plaster in glazed wood case, *from the Lower Lias, of Jurassic age (approximately* 150 *million years old), Lyme Regis, Dorset*

190 BELEMNITES. Two specimens of long belemnites, 10.5 and 10in long, both in Lower Lias matrix, mounted in plaster in glazed wood cases, *from the Lower Lias, of Jurassic age (approximately* 150 *million years old), Lyme Regis, Dorset* (2)

191 ICHTHYOSAUR. The head and jaws of an ichthyosaur, probably *Ichthyosaurus platyodon*, with prominent teeth and large orbit, 30in long, mounted in plaster in wood box, 34.5 by 17in, *from the Lower Lias, of Jurassic age (approximately* 150 *million years old), Lyme Regis, Dorset*

192 FOSSIL FISH. A specimen of the fossil fish *Furo sp.*, 7.8in long, in Lower Lias matrix, mounted in plaster in glazed wood case, *from the Lower Lias, of Jurassic age (approximately* 150 *million years old), Lyme Regis, Dorset*

193 FOSSIL FISH. Two specimens of the fossil fish *Dapedium sp.*, one with well-preserved head regions, the other with fine scales, 9 and 11in long, mounted in plaster in glazed wood case, *from the Lower Lias, of Jurassic age (approximately* 150 *million years old), Lyme Regis, Dorset*

194 CRINOIDS. Two specimens of the crinoid *Pentacrinites fossilis* (Blumenbach), 8.5 and 8in long, in Lower Lias matrix, mounted in plaster in glazed wood case, *from the Lower Lias, of Jurassic age (approximately* 150 *million years old), Lyme Regis, Dorset*

195 BELEMNITE. A specimen of a Jurassic belemnite, with the phragmacone, probably *Passaloteuthis apicurvata* (Blainville), in Lower Lias matrix, mounted in plaster in glazed wood case, *from the Lower Lias, of Jurassic age (approximately* 150 *million years old), Lyme Regis, Dorset*

196 FOSSIL FISH. A specimen of the fossil fish *Dapedium sp.*, 10in long, in Lower Lias matrix, mounted in plaster, *from the Lower Lias, of Jurassic age (approximately* 150 *million years old), Lyme Regis, Dorset*

197 ICHTHYOSAUR. Part of the jaws of an ichthyosaur with some teeth, 6in long, mounted in plaster in glazed wood case; and the paddle of an ichthyosaur, 7.5in long, mounted in plaster in glazed wood case, *both from the Lower Lias, of Jurassic age (approximately* 150 *million years old), Lyme Regis, Dorset* (2)

198 FOSSIL FISH. A fragmentary specimen of the fossil fish *Heterolepidotus latus*, 20in long, in Lower Lias matrix, mounted in plaster, *from the Lower Lias, of Jurassic age (approximately* 150 *million years old), Lyme Regis, Dorset*

199 AN ICHTHYOSAUR. A fine and well-preserved specimen of the Ichthyosaur *Ichthyosaurus communis*, with well-preserved left front paddle, the left hind paddle fragmentary, prominent teeth and head regions, the spinal column almost complete, 46.5in long, on Lower Lias matrix, mounted in plaster in wood box, 51 by 13.5in, *from the Lower Lias, of Jurassic age (approximately* 150 *million years old), Lyme Regis, Dorset*

See illustration, and detail of head region and left front paddle

END OF MORNING SALE

BRITISH FOSSIL FOOTPRINTS IN THE COLLECTIONS OF SOME PRINCIPAL BRITISH MUSEUMS

by W. A. S. Sarjeant

When an account of the history of the study of British fossil footprints up to 1972 was submitted for publication, an Appendix listing footprint holdings of English museums was included. Unfortunately, by editorial decision this Appendix was omitted from the published work (Sarjeant, 1974). On the suggestion of Dr. Michael G. Bassett, a revised version of the list has been prepared and is presented here. It has been updated, with the help of the persons named in the text, and expanded to include some museums in Scotland and Wales also. I hope that, with the present growth in interest in palaeoecology, this list will be found useful.

To reduce this paper to manageable proportions, only a very short reference list is appended. Instead, reference numbers of papers published up to 1972 are quoted in italics, thus "(*76*)", keying the list with the earlier *Bibliography* (Sarjeant, 1974).

A supplement to that earlier work, listing references omitted therefrom and summarizing developments in British vertebrate palaeoichnology between 1972 and 1982, presently is being prepared for publication by Justin Delair and the author. Mr. Delair plans also, at some future date, to publish one or more supplements to this paper covering the fossil footprint holdings of some other British museums.

ENGLAND

BRITISH MUSEUM (NATURAL HISTORY), LONDON.

List based on information courteously furnished by Dr. C.A. Walker.

1. Rhynchosauroid footprints R.3483. Keuper Sandstone (Triassic) Storeton Quarries, Bebington, Cheshire. Purchased from Charles Wells, 1906

2. ?*Rhynchosauroides* sp. R.34835. Red Sandstone (Permian), Devon. Presented by Lady Butlin, 1927.

3. *Rhynchosauroides* sp. 33156. Keuper Sandstone (Triassic), Staunton, 2 1/2 miles from Burton-on-Trent, Staffs. Purchased, 1858.

4. *Rhynchosauroides* sp. 21834. Keuper Sandstone (Triassic), Staunton, 2 1/2 miles from Burton-on-Trent, Staffs. Purchased 1848.

5. *Rhynchosauroides* sp. 40154. Keuper Sandstone (Triassic), Coven, nr. Brewood, South Staffs. Presented by Rev. H. Housman, 1862.

6. *Rhynchosauroides* sp. 38803. Keuper Sandstone (Triassic), Coven, nr. Brewood, South Staffs. Presented by Rev. H. Housman, 1862.

7. *Rhynchosauroides* sp. 38805. Keuper Sandstone (Triassic), Coven, nr. Brewood, South Staffs. Presented by Rev. H. Housman, 1862.

8. *Chirotherium* sp. p. R.2952. Keuper Sandstone (Triassic), Storeton, Cheshire. G.H. Morton Collection, purchased 1900. Three slabs, one figured by Morton in *The Geology of Liverpool*, 1891, 1898 (*127, 128*).

9. *Chirotherium* sp. R.3483. Keuper Sandstone (Triassic), Storeton, Quarry, Bebington, Cheshire. Purchased from Charles Wells, 1906.

10. *Chirotherium storetonense* Morton* R. 2951. Lower Keuper Sandstone (Triassic), Storeton Quarries, Bebington, Cheshire. G.H. Morton Collection, purchased 1900. Three slabs.

11. *Chirotherium storetonense* Morton. R.2953. Lower Keuper Sandstone (Triassic), Storeton Quarries, Bebington, Cheshire. G.H. Morton Collection, purchased 1900. Three slabs. Plaster casts.

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* Considered by Haubold 1971 (*306*, p. 55) to be a junior synonym of *Chirotherium barthii* Kaupp.

12. *Chirotherium storetonense* Morton. 19621. Upper Keuper Sandstone (Triassic), Lymm, nr. Warrington, Lancs. Presented by Lord Francis Egerton, 1845.

13. *Chirotherium storetonense* Morton. 21831. Upper Keuper Sandstone (Triassic), Lymm, nr. Warrington, Lancs. Purchased, 1848.

14. *Isochirotherium herculis* (Egerton) Haubold. R.295A. Holotype. Upper Keuper Sandstone (Triassic), Lymm, nr. Warrington, Lancs. [See Egerton, 1838 (*96*) and discussion in Sarjeant, 1974]

15. *Chirotherium minus* Sickler*. R.4834. Keuper Marl (Triassic), Moorside, Crosbie, Lancs. G.H. Morton Collection? Cast of print, probably the holotype.

16. *Chirotherium storetonense* Morton. R.729. Lower Keuper Sandstone (Triassic), Storeton Quarries, Bebington, Cheshire. Presented by J. Tomkinson Esq.

17. *Chirotherium* sp. R.414. New Red Sandstone (Triassic), Cheshire (locality unstated). Purchased from J.S. Gardner, 1884.

18. *Chirotherium* sp. R.732. Triassic. Locality and history unknown. Two slabs.

19. *Chirotherium* sp. R.295. Upper Keuper Sandstone (Triassic), Lymm, Cheshire. Purchased from Sir Philip Gray Egerton, 1882. Six slabs.

20. *Chirotherium* sp. R.398. Keuper Sandstone (Triassic), Storeton, Cheshire. Presented by C. Westerndarp Esq., 1886.

21. *Chirotherium* sp. R.3715. Lower Keuper Sandstone (Triassic), Storeton, Cheshire. Presented by Henry C. Beasley, 1909. [Described by Beasley, 1910 (*76*)].

22. Anomodont reptile or monotreme. Lower Keuper Sandstone (Triassic), South Quarry, Storeton, Cheshire. Presented by Prof. H.G. Seeley. [Described by Beasley, 1898 (*76*) and Seeley, 1899 (*138*)].

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* Considered by Haubold 1981 (*306*, p. 55) to be a junior synonym of *Chirotherium sickleri* Kaup.

23. Tridactyl dinosaur footprint. R.2950. Sandstone block (Mesozoic), Kiess, Caithness. Presented by Sir Francis Tress Barry, 1900. [Described and illustrated by Sarjeant, 1974].

24. Reptilian footprints. R.3298. Presented by Joseph Lomas Esq. Plaster casts of 13 prints from the English Trias, to illustrate Reports 1 and 2 of the British Association Committee on the Flora and Fauna of the Triassic. [See Beasley, 1903, 1905 (*80, 82*) and Sarjeant, 1974].

25. Reptilian footprint. R.4380. Inferior Oolite (Middle Jurassic), Saltwick, nr. Whitby, Yorks. Presented by H. Brodrick Esq. [See Brodrick, 1909 (*289*) and Sarjeant, 1974].

26. Reptilian footprint. R.4831. Inferior Oolite (Middle Jurassic), Saltwick, nr. Whitby, Yorks. Presented by H. Brodrick Esq. [See Brodrick, 1909 (*289*) and Sarjeant, 1974].

27. Reptilian footprint. R.4832. Lower Keuper Sandstone (Triassic), Storeton Quarries, Bebington, Cheshire. Presented by Henry C. Beasley, 1910. [See Beasley, 1910 (*86*)].

28. Reptilian footprint. R.4833. Lower Keuper Sandstone (Triassic), Storeton Quarries, Bebington, Cheshire. Presented by Henry C. Beasley, 1910. [See Beasley, 1910 *(86)*].

29. "Labyrinthodont". R.733. Locality and history unknown.

30. *Chelichnus duncani* (Owen) Jardine. 43576. New Red Sandstone (Permian), Corncockle Muri, nr. Applegarth, Dumfries-shire. Purchased 1872. [Mentioned by Delair, 1966 (*11*), p. 20].

31. Iguanodontid and megalosaurid tracks. Numerous prints from the Purbeck Beds (Early Cretaceous) of the Isle of Purbeck, Dorset, including four long trackways from "Mutton Hole" Quarry, Herston. [The specimen described by Swaine, 1962 (*191*) and Charig and Newman, 1962 (*178*) and discussed in Sarjeant, 1974, is on long-term loan to the Manchester Museum].

INSTITUTE OF GEOLOGICAL SCIENCES

List based on a letter written by Dr. F.W. Anderson to Professor L.J. Wills in 1955, supplemented and corrected by information courteously furnished by Dr. Hugh Ivimey-Cook and Mr. E.P. Smith.

Specimens in the Geological Survey Museum, London

A. Triassic

1. *Chirotherium storetonense* Morton. IGS. GSM57816. Lower Keuper Sandstone, Storeton Quarries, Bebington, Cheshire. Le Neve Foster Collection, 1871.
2. Unidentified 3-toed footprints. IGS. Geol.Soc.Coll. GSd.2923-4. Keuper Waterstones, Rathbone St. Quarry, Liverpool. Liverpool Natural History Society Collection, presented by the Geological Society of London, 1911. [Mentioned by Morton, 1891 (*127*) and Sarjeant, 1974].
3. *Rhynchosauroides* sp. IGS. GSM53766, 56824-5. Grinshill Sandstone (Lower Keuper), Grinshill Quarries, near Clive, Shropshire. Presented by Miss Kilvert, 1934.
4. Unidentified 5-toed footprint. IGS. GSM90506. Lower Keuper Sandstone, Storeton Quarries, Bebington, Cheshire. Le Neve Foster Collection, 1871.
5. Cast of "*Chirotherium*". IGS. GSM59907. Lower Keuper Sandstone, Storeton Quarries, Bebington, Cheshire. Presented by Hugh Strickland, 1852.
6. *Rhynchosauroides* sp. (3-toed). IGS. GSM3830. Lower Keuper Sandstone, probably Storeton Quarries, Bebington, Cheshire. Purchased from J. Gregory, 1891.
7. Unidentified ?4-toed footprints. IGS. GSM53792, 53793, Zf.957-973. Upper Coal Measures (Carboniferous), Enville Beds, Slade Heath Borehole No. 1, Four Ashes, Wolverhampton, Staffs. Presented by Dr. Frank Raw, 1922.

8. Reptilian footprints. IGS. GSM86981. Upper Mottled Sandstones at 336ft depth, No. 2 Borehole of Churchill Pumping Station, 3 miles NE of Kidderminster, Worcs. Plaster cast, presented by Prof. Leonard J. Wills, May 1957. [Described by Wills and Sarjeant, 1970 (*284*); donation noted by Sarjeant, 1974].

9. Reptilian footprints. IGS. GSM90507-19. Various localities in Cheshire. Presented by Joseph Lomas Esq. Plaster casts of 13 prints used to illustrate Reports 1 and 2 of the British Association Committee on the Flora and Fauna of the Triassic. (Originals presented to the Liverpool City Museum by Henry C. Beasley; that Museum was destroyed by bomb damage in 1941 and, though many footprint slabs survive, they are now unlabelled. The original of one specimen, GSM90513, was presented to Liverpool University.) [See Beasley, 1903, 1905 (*80, 82*) and Sarjeant, 1974].

10. Undetermined footprints. IGS. GSM7339. Triassic Sandstone, probably of Elgin, Morayshire.

11. *Chelichnus megacheirus* Huxley. Holotype GSM8687. Triassic Sandstone, Elgin, Morayshire. [Described and illustrated by Huxley, 1977 (*48*)].

12. *Chelichnus megacheirus* Huxley. Paratype. IGS. GSM8688. Triassic Sandstone, Elgin, Morayshire. [Described and illustrated by Huxley, 1877 (*48*)].

13. Rhynchosauroid reptile. IGS. GSM113445. Keuper Sandstone, Masons Heugh Quarry, Cummingstone, near Elgin, Morayshire. Capt. Lambart Brickenden Collection, presented 1854. [Described and illustrated by Brickenden, 1852 (*43*) and Sarjeant, 1974].

14. *Chirotherium storetonense* Morton. Lower Keuper Sandstone, Charles Wells' Quarry, Storeton Hill, Bebington, Cheshire.

15. *Chirotherium storetonense* Morton. IGS. GSM113437. Lower Keuper Sandstone, Storeton Quarries, Bebington, Cheshire. Set of tracks (natural casts) about five feet long. Transferred from Museum Department.

16. *Chirotherium storetonense* Morton. IGS. GSM113438. Plaster cast of last.

17. ?Reptilian footprints. IGS. Zr7599. Keuper Sandstone, Grinshill Sandstone, Mount Pleasant Quarry, Grinshill, Shropshire. Presented by Mr. Thursby, 1971.

18. "*Chelichnus*" sp. (very indistinct). IGS. GSM103203. "Permo-Trias", Corncockle Quarry, near Applegarth, Dumfries-shire. Presented by Matthew Moggridge, 1874. [Mentioned by Delair, 1967 (*12*), p. 2].

19. Reptilian footprints. IGS. Geol.Soc.Coll. GS.4867-70. Triassic, Weston, near Runcorn, Cheshire. Plaster casts of footprints collected by J. Black, presented by the Geological Society of London, 1911. [Described by Black, 1846 (*92*)].

B. Cretaceous

20. *Iguanodon* footprints. IGS. Geol.Soc.Coll. GS.376. Wealden, cliffs east of Hastings, Sussex. Ex collection of Rev. E. Tagart, presented by the Geological Society of London, 1911. [Described by Tagart, 1846 (*255*) and illustrated by Sarjeant, 1974].

21. *Iguanodon* footprints. IGS. GSM37960-61. Hastings Beds, Wealden, Galley Hill, Hastings, Sussex. Presented by H.W. Wilson, 1921. [Cited by Sarjeant, 1974].

GROSVENOR MUSEUM, CHESTER.

List based on information courteously furnished by Miss Margaret Gillison of the Grosvenor Museum, who comments (*in litt.*)--

"The great majority of these specimens were collected by O.W. Jeffs and presented by him to the Museum; these specimens are indicated by the

initials OWJ in the following list. Other collectors are given their full names. It is known that Jeffs worked in close collaboration with H.C. Beasley and that one, or most likely more, of the specimens were the subject of Beasley's photographs.

The numbering of the specimens is somewhat arbitrary. The Jeffs collection were either given or displayed in two cases. In Case I, they were lettered A, B, C, etc. In Case II, the lettering was A, B, C, etc. Some of these specimens show the original numbering given to them by Jeffs: these are shown in brackets -- (OWJ. 123), (OWJ. 130), etc. Further specimens added to the displays, not collected by Jeffs, were given letters and numbers such as A_3. The reasoning behind this is unknown.

During the 1930s, the natural history collections were dispersed and, to some extent, destroyed. Subsequent workers in the Natural History Department have attempted to collate the surviving specimens with the very illegible notes left by Jeffs. It would appear that there are still some specimens missing, but there are also some specimens without any number on them and it is most probable that, among these, the missing ones will be found. All specimens without numbers have, for the time being, been given reference numbers Z_1, Z_2 etc."

In the list which follows, specimens exhibiting only sedimentary structures are omitted. All specimens listed are from Lower Triassic (Keuper) sandstones.

A. Prints of *Rhynchosauroides* and another species (not determinable). Oxton, Heath, Birkenhead, Cheshire. Collected by Dr. Charles Ricketts. [Z5]. [Described by Ricketts, 1886 (*136*)].

B. Prints of *Rhynchosauroides* (imperfectly formed). Oxton, Heath, Birkenhead, Cheshire. OWJ [Z9].

C. *Isochirotherium herculis* (Egerton) Haubold: hind-foot impression. Storeton Quarries, Bebington, Cheshire. (OWJ). [Missing?]

D. "Rain pitting on surface, with medial impression, probably a tail track of a reptile". Storeton Quarries, Bebington, Cheshire. (OWJ).

F. *Rhynchosauroides* foot impressions and tail track. Storeton Quarries, Bebington, Cheshire. (OWJ. 123).

H. ?Footprint. Storeton Quarries, Bebington, Cheshire. (OWJ).

J. *Rhynchosauroides* -- impressions of claws superimposed on original footprint. Storeton Quarries, Bebington, Cheshire. (OWJ. 125). [See O.W. Jeffs, 1894b (*111*), pl. 1 fig. 4].

K. *Chirotherium* sp. Storeton Quarries, Bebington, Cheshire. (OWJ. 136).

L. *Rhynchosauroides* sp. Storeton Quarries, Bebington, Cheshire. (OWJ). [Missing]

N. Small footprints (indeterminate) and suncrack. Storeton Quarries, Bebington, Cheshire. (OWJ. 119).

O. *Rhynchosauroides* sp. Storeton Quarries, Bebington, Cheshire. (OWJ. 113).

P. ?Chelonian. Storeton Quarries, Bebington, Cheshire. (OWJ. 120). [See O.W. Jeffs, 1894b (*111*), pl. 1 fig. 2].

R. ?Footprint. Storeton Quarries, Bebington, Cheshire. (OWJ. 124). [See O.W. Jeffs, 1894b (*111*), pl. 2 fig. 3].

S. Very small footprint (genus indet.) Storeton Quarries, Bebington, Cheshire. (OWJ. 122).

T. Impressions of (a.) *Rhynchosauroides* and (b.) ?"Similar to Eccup. (Newstead)". Storeton Quarries, Bebington, Cheshire. (OWJ. 124).

U. *Chirotherium* sp. Storeton Quarries, Bebington, Cheshire. (OWJ).

V. Footprint of small saurian superimposed on ripple mark. Storeton Quarries, Bebington, Cheshire. (OWJ. 127). [See O.W. Jeffs, 1894b (*111*), fig. 6].

W. Small saurian footprint with claws. "Note: H.G. Seeley says this is an *Anomodont*, the bones of which are at present unknown". Storeton Quarries,

Bebington, Cheshire. (OWJ. 129). [See O.W. Jeffs, 1894b (*111*): Beasley 1898 (*76*) p. 237, etc.]

X. Small saurian footprints. Storeton Quarries, Bebington, Cheshire. (OWJ. 125).

A_3 a. & b. Impression and cast of small saurian footprint. Upper Keuper, nr. Eddisbury, Cheshire. Collected by R. Newstead.

A_1. *Chirotherium storetonense* Morton: manus & pes, with traces of scales of epidermis. Storeton Quarries, Bebington, Cheshire. (OWJ. 130). [See O.W. Jeffs, 1894b (*111*), pl. 1 fig. 1].

B_1. *Chirotherium* sp.: hind and fore feet. Storeton Quarries, Bebington, Cheshire. (OWJ) Missing? Or may be Z_1 and Z_7.

C_1. Footprint undetermined. Storeton Quarries, Bebington, Cheshire. (OWJ. 134).

D_1. *Chirotherium storetonense* Morton: "original impression". Storeton Quarries, Bebington, Cheshire. (OWJ) Missing?

E_1. Footprints of small saurian. Storeton Quarries, Bebington, Cheshire. (OWJ) Missing?

F_1. *Isochirotherium herculis* (?). Storeton Quarries, Bebington, Cheshire. (OWJ)

G_1. Footprint, species unknown. Storeton Quarries, Bebington, Cheshire. (OWJ. 121).

H_1. *Rhynchosauroides* sp. Storeton Quarries, Bebington, Cheshire. (OWJ) Missing?

J_1. Slab with several varieties of footprints (*Rhynchosaurus*, etc.) South Quarry, Storeton, Bebington, Cheshire. Collected by Norman L. Jeffs and OWJ. Missing?

Z_1. *Chirotherium* sp.: hind and (?) fore feet.

Z_2. Claw marks (?*Rhynchosaurus*) and sun-cracks.

Z_3. *Chirotherium* sp.: cast of single footprint. Lymm, Cheshire.

Z_4. *Chirotherium* sp.: single footprint.

Z_6. *Isochirotherium herculis* (Egerton) Haubold. Single print. Presented by Miss Potts.

Z_7. *Chirotherium* sp.: casts of hind and fore feet.

Z_8. *Chirotherium* sp.: (cast of hind foot) and small saurian foot and claw marks.

Z_9. Several prints of *Rhynchosaur* sp., some imperfectly formed.

Z_{10}. *Chirotherium* sp.: (cast of hind foot) and small saurian.

Z_{11}. Many footprints of several types.

Z_{12}. Footprints (casts) with claw marks, footprint of *Rhynchosauroides* and ?sun-crack.

Z_{13}. Large slab with large number of footprints, of several types. Possibly J_1?

Z_{14}. Several prints of *Rhynchosauroides* sp., with possible tail track.

Z_{15}. *Chirotherium* sp.: hind and fore feet, on very large slab.

Z_{16}. *Chirotherium* sp.:(hind and fore feet) and tracks of small saurians, on large slab.

Z_{17}. *Chirotherium* sp.: hind and fore feet, on rain-pitted surface, with (?) claw marks of a small saurian.

Plaster Casts.

A_2. Casts of footprints from the Lower Keuper Sandstone (Nos. 1-13) taken from originals in the H.C. Beasley collection.

A_4. Cast of footprints from Storeton Quarries, Bebington, Cheshire. Presented by H.C. Beasley, July 1906.

Y. Cast of specimen from Weston, nr. Runcorn, Cheshire. Presented by H.C. Beasley.

BOROUGH MUSEUM, BOOTLE, LANCS.

The Director, Mr. A.R. Hardman, courteously confirmed that 10 slabs of fossil footprints are preserved in the Museum's collections. These are numbered 1-10 and are illustrated by Beasley's photographs nos. 1-7, 214, 261a and 218 [see Sarjeant, 1971 (*318*)]. Slabs nos. 1, 2, 4-6 and two others (Beasley's 214 and 261a) are fixed to walls and covered with panel doors; slab no. 6 was obtained by exchange from Hessburg, Germany, all others are from Cheshire. Slabs nos. 3

and 7 suffered wartime damage: portions are in store in the Museum's basement. Slab no. 10 (Beasley no. 1) is a cast of the holotype of *Chirotherium storetonensis* Morton.

CASTLE MUSEUM, NORWICH

The following note is based on information courteously supplied some years ago by Mr. B. McWilliams, the Keeper of Natural History, and recently brought up to date by Miss Diana M. Smith, the Museum Geologist.

1. The Museum's collections contain, under catalogue no. 14-40:--

"5 Blocks of Sandstone containing the footsteps of the *Chirotherium*, and one containing footsteps of the *Ornithichnites diversus?*," [now *Steropoides diversus* (Hitchcock) Lull] "found 70' deep in Storeton Quarry near Liverpool." Presented by the Rev. Joseph Crompton, M.A., of Norwich. Three of these were photographed by Henry C. Beasley [see Sarjeant, 1971 (*266*)]. The block in his photograph 14 is on display in the Museum's Permo-Trias case; the natural cast, seen in his photograph 15, is in an "Introduction to Geology" case and the impression in store.

A second block on display in the Permo-Trias case, also from Storeton, is labelled "Given by D.W. Crompton 1865" but bears no number. Despite its different labelling, it must be presumed to form part of the same donation. The fifth specimen from this donation has not been located.

2. Footprints of *Iguanodon*, unlocalized but certainly from the Wealden (Early Cretaceous) of Sussex, are displayed in the Lower Cretaceous case. Donated by Gideon Mantell in May 1928; specimen no. 54.28.

ROWLEY'S HOUSE MUSEUM, SHREWSBURY

The collections lodged originally in the Castle Gates Museum, where Henry C. Beasley examined them, were transferred in 1974 to Clive House Museum and around 1980 to their present lodgement. The information that follows was furnished

originally by Mr. R. James, Assistant Curator of the Castle Gates museum, and courteously updated by Diana M. Smith of the Castle Museum, Norwich.

1. *Chirotherium* sp. Grinshill Sandstone (Lower Keuper:Triassic), Grinshill Quarries, nr. Clive, Salop. Presented by Mr. Phillips, 1896. On display.
2. Small reptilian footprints. Grinshill Sandstone (Lower Keuper:Triassic), Grinshill Quarries, nr. Clive, Salop. Large slab (in two pieces). Presented by the Grinshill Quarrying Co., 1982. On display.
3. *Rhynchosauroides articeps* (Owen) Morton. Grinshill Sandstone (Lower Keuper:Triassic), Grinshill Quarries, nr. Clive, Salop. Donated by Mr. Phillips, 1896. Rhynchosauroid print D_1 of Beasley, 1904 (*81*). [Illustrated by Beasley photograph 68; see Sarjeant, 1971 (*318*)].

NATURAL HISTORY MUSEUM, WOLLATON PARK, NOTTINGHAM

Before leaving Nottingham for Canada in 1972, the author arranged for the transfer of the specimens listed below on permanent loan from the Department of Geology, University of Nottingham, to this Museum. I am indebted to Mr. G. Playle, the Curator, for the curatorial details. (The PC numbers quoted are those under which the specimens formerly were lodged in the University collections).

PL1.1.1971. *Swinnertonichnus mapperleyensis* Sarjeant. Holotype (PC3315). Keuper Waterstones, Mapperley Park, Nottingham. Collected by H.H. Swinnerton. [Described by Sarjeant, 1967 (*212*)].

PL1.2.1971. *Deuterotetrapous plancus* Sarjeant. Holotype (PC3307). Keuper Waterstones, Dale Abbey, Stanton-by-Dale, Derbyshire. Collected by H.H. Swinnerton. [Described by Sarjeant, 1967 (*212*)].

PL1.3.1971. *?Otozoum swinnertoni* Sarjeant. Holotype (PC4238). Keuper Waterstones, Mapperley Park, Nottingham. Collected by H.H. Swinnerton. [Described by Sarjeant, 1967 (*212*)].

PL1.4.1971. *Coelurosaurichnus* sp. Figured specimen (PC3316). Keuper Waterstones, Mapperley Park, Nottingham. Collected by H.H. Swinnerton. [Described by Sarjeant, 1967 (*212*)].

PL1.5.1971. *Microsauropus* aff. *acutipes* Moodie* and *Varanopus* aff. *curvidactylus* Moodie. Figured specimens (PC3317). Keuper Waterstones, Mapperley Park, Nottingham. Collected by H.H. Swinnerton. [Described by Sarjeant, 1967 (*212*)].

PL1.6.1971. *Brachychirotherium coburgense* Aumann. Figured specimen (PC3317). Keuper Waterstones, Mapperley Park, Nottingham. Collected by H.H. Swinnerton. [Described by Sarjeant, 1967 (*212*)].

PL1.7.1971. Undescribed footprints. (PC3439). Keuper Waterstones, Dale Abbey, Stanton-by-Dale, Derbyshire. Collected by H.H. Swinnerton.

PL1.8.1971. *Swinnertonichnus mapperleyensis* Sarjeant. Specimen PC3437. Keuper Waterstones, Mapperley Park, Nottingham. Collected by H.H. Swinnerton.

PL1.9.1971. Undescribed footprints (PC3441). Keuper Waterstones, Mapperley Park, Nottingham. Collected by H.H. Swinnerton.

PL1.10.1971.Undescribed footprints (PC3440). Keuper Waterstones, Mapperley Park, Nottingham. Collected by H.H. Swinnerton.

PL1.11.1971.*Chelichnus hicklingi* Nopsca emend. Sarjeant. Holotype (PC3128). Mansfield Red Sandstone, Rock Valley Quarry, Mansfield, Notts. Collected by Francis Holmes. [Described by Hickling, 1906, 1906 (*209, 210*) and Sarjeant, 1966 (*211*)].

LEICESTER CITY MUSEUMS, LEICESTER

List based on information courteously furnished by Mr. Patrick J. Boylan (Director, Leicestershire Museums and Art Galleries).

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* This species is considered by Haubold (1971) to be a junior synonym of *Erpetopus willistoni* Moodie. In ichnogeneric terms, Haubold's allocation may be correct; but I do not consider the two species to be synonymous.

1. *Isochirotherium* cf.*herculis* (Egerton). Greenish sandstone of Lower Keuper (Triassic), Derby Road, Kegworth, Leics. Specimen no. 122'1909; collected by J. Large. [Described by Maidwell, 1916 (*200*) and illustrated by Sarjeant, 1974].
2. *Chirotherium storetonensis* Morton. Keuper Sandstone (Triassic), Storeton Quarries, Bebington, Cheshire. Specimen no. 262'1971. [Figured by Sarjeant, 1974, p. 313].
3. *Chirotherium* sp. Sandstone of ?Upper Keuper (Triassic), Newhurst Quarry, Shepshed, Leics. Specimen no. 878'1973.
4. *Chirotherium* sp. Three prints from complete track. Upper Keuper Sandstone (Triassic), Newhurst Quarry, Shepshed, Leics. Specimen nos. 934'1977/1-3.
5. *Chirotherium* sp. Upper Keuper Sandstone (Triassic), Newhurst Quarry, Shepshed, Leics. Specimen no. G10.1978.
6. "*Iguanodon*" sp. Two specimens. Lulworth Beds, Purbeck Series (Early Cretaceous), Suttle's Quarry, Swanage, Dorset. Specimen no. 317'1970.

MANCHESTER MUSEUM, MANCHESTER

The list that follows was courteously furnished by Dr. R.M.C. Eagar (Keeper of Geology and Deputy Director, Manchester Museum).

1. *Chelichnus hicklingi* Nopcsa emend. Sarjeant. Topotype. Mansfield Red Sandstone (Permian), Rock Valley Quarry, Mansfield, Notts. [Described by Hickling, 1906, 1909 (*208*, *209*) and Sarjeant, 1966 (*211*)].
2. *Chelichnus* sp. L.10275, G. Hickling Collection. Permian. Cuttie's Hillock, Elgin, Morayshire. [Described by Watson and Hickling, 1914 (*54*)].
3. *Chelichnus hicklingi* Nopsca emend. Sarjeant. L.6334. Trackway; topotype. The "short series" of Hickling, 1906 (*208*) and Sarjeant, 1966 (*211*).
4. *Chelichnus ingens* Binney. Holotype. L.1676. Millstone Grit Series sandstone (Carboniferous:Namurian). Tintwistle, near Mottram-en-Longdendale,

Cheshire. Collected prob. by E.W. Binney. [Described by Binney, 1856a b (*90, 91*) and figured by Sarjeant, 1974, p. 326].

5. Chirotherioid footprints, natural moulds in sandstone. LL.6653. Mounted adjacent to L.1677, above. Keuper Waterstones (Triassic)? Probably Cheshire. Slab 1.49 x 1.00 m.

6. *Chirotherium* cf.*storetonensis* Morton of Kuhn, 1963 (*313*). Natural mould in sandstone. Form A2 of Beasley, 1896 (*73*). Ll.6654. Lower Keuper Sandstone (Triassic) probably from Cheshire. Slab 0.46 x 0.33 m.

7. Chirotherioid footprints, natural moulds in sandstone with moulds of sun-cracks. LL.6655a, b. (a) with manus, pes and rhynchosaurid moulds, (b) with pes. Each slab 0.36 x 0.27 m. Probably from the Keuper Waterstones (Triassic), Cheshire.

8. Chirotherioid and rhynchosaurid footprints as natural sandstone moulds, LL.6656. Lower Keuper Sandstones (Triassic), Storeton Quarries, Bebington, Cheshire. Slab 1.90 x 1.58 m.

9. Chirotherioid footprints as natural moulds. Ll.6657. Keuper Sandstone (Early Triassic), Storeton Quarries, Bebington, Cheshire. Presented by W.B. Stewart. Slab 2.00 x 0.90 m.

10. Chirotherioid footprints as natural moulds, LL.6658. Probably from the Lower Keuper Sandstone (Triassic), Storeton Quarries, Bebington, Cheshire. Slab 1.35 m x 0.51 m.

11. Chirotherioid footprints as natural moulds, LL.6659. Possibly from the Keuper Sandstone (Early Triassic), Storeton Quarries, Bebington, Cheshire. Slab 0.92 m x 0.75 m.

12. Chirotherioid footprints as natural moulds on ripple-marked sandstone. LL.6662. Manus and pes and part of another pes. Probably from the Keuper Sandstones (Early Triassic), Storeton Quarries, Bebington, Cheshire. Slab 0.61 x 0.60 m.

13. Chirotherioid footprints as natural moulds, with moulds of sun-cracks. LL.6664. Probably from the Keuper Sandstone (Early Triassic) of Cheshire. Slab 0.71 x 0.64 m.

14. Chirotherioid footprints as natural moulds, with moulds of sun-cracks. LL.6665. Probably from the Keuper Sandstone (Early Triassic) of Cheshire. Slab 0.81 x 0.55 m.

15. Chirotherioid pes as natural mould, with moulds of sun-cracks. LL.6667 Probably from the Keuper Sandstone (Early Triassic) of Cheshire. Slab 0.40 x 0.43.

16. Chirotherioid footprints as natural moulds. LL.6668. Probably from the Keuper Sandstone (Early Triassic) of Cheshire. Slab 0.94 x 0.65 m.

17. *Chirotherium* sp., natural cast, deeply impressed, of manus and pes, LL.6669 a, b respectively, (a) Collected by W.C. Williamson. (b) Probably from the Williamson Collection; probably from Cheshire. [LL.6669a **is** *not* the specimen described by Williamson, 1867 (*150*) from the Keuper Sandstone (Early Triassic) of Daresbury, Cheshire].

18. *Chirotherium kaupii* Morton*. Natural moulds in red sandstone. LL.6660 a-b. From Worsley Hall, Cheshire. Slab (a) 1.5 x 0.65 m and (b) 0.68 x 0.5 m (triangular). [The first may be the specimen mentioned by Rawlinson, 1853 (*134*, footnote) as having been presented to the Geological Society of London].

19. Impressions of footsteps, including *Rhynchosauroides rectipes* Maidwell, *R. membranipes* Maidwell** and the holotype of *R. minutipes* Maidwell. Collected by Fereday G. Smith. L.1677. Lower Keuper Sandstone (Triassic), Over Hill Quarry, near Runcorn, Cheshire. [Described by Black, 1846 (*92*), Beasley, 1896, 1904 (*73, 81*), Watson, 1909 (*148*) Maidwell, 1911, 1914 (*117, 118*)].

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* Considered by Kuhn, 1963 (*313*, p. 68) to be a junior synonym of *Chirotherium barthii* Kaupp.

** Considered by Haubold, 1971 (**306**, p. 46) to be a junior synonym of *R.rectipes* Maidwell.

20. Rhynchosauroid footprints as natural sandstone moulds on ripple-marked sandstone. L.7574. Collected by M. Stirrup. Keuper Waterstones (Triassic), Storeton Quarries, Bebington, Cheshire.

21. Rhynchosauroid footprints, very numerous as natural moulds. LL.6661. Probably from Triassic of Cheshire. Slab 1.30 x 0.60 m.

22. Rhynchosauroid footprints as natural moulds on ripple-marked sandstone LL.6663. Probably from Triassic of Cheshire. Slab 0.67 x 0.46 m.

23. Rhynchosauroid footprints as natural moulds. LL.6666. Possibly from the Triassic of Storeton Quarries, Bebington, Cheshire. Slab 0.80 x 0.39 m. (triangular).

24. Rhynchosauroid footprints as natural moulds. LL.6670. Slab 1.29 x 0.39 m. Possibly from the Triassic of Storeton Quarries, Bebington, Cheshire.

25. *Rhynchosauroides beasleyi* Nopsca. L.8040. Collected by C. Birley. [Type D7 of Maidwell, 1914 (*118*)]. At present unlocated in the collections.

26. *Rhynchosauroides* sp. Natural casts of footprints on ripple-marked sandstone. L.10344. Collected by M. Stirrup. Triassic, nr. Beeston, Cheshire.

27. *Rhynchosauroides articeps* (Owen) Morton. Mould of single footprint LL.6671. Grinshill Sandstone (Triassic), Grinshill Quarries, nr. Clive, Shrops.

28. *Chirotherium* cf. *barthi* Kaup. Natural mould in sandstone from Red Brow Quarry, Daresbury, Cheshire, LL.5511. Figured by Ireland, R.J., Pollard, J.E., Steel, R.J. and D.B. Thompson. *Proc.Yorks.geol.Soc.* 41 (1978), (399-435), pl. 22, fig. 4. Donor: Mr. Philip Holroyd.

29. *Chirotherium* cf. *barthi* Kaup. Counterpart of 19 (a) above, formed in sandstone with mud drape, LL.5510. Donor: Mr. Philip Holroyd.

30. Rhynchosauroid footprints on a small slab of sandstone, 7 x 10 cm, from the Triassic of Runcorn Hill, Cheshire. LL.6678. E. Collected by J.W. Jackson.

The Museum also has, on long-term loan from the British Museum (Natural History), a double trackway of footprints (ascribed to *Megalosaurus*) in Purbeck Limestone from Herston Quarry, Swanage. [See BRITISH MUSEUM (NATURAL HISTORY), item 31].

SALFORD MUSEUM OF MINING, SALFORD, GREATER MANCHESTER

Chelichnus ingens Binney. Holotype. Millstone Grit Sandstones, Tintwistle, nr. Mottram-en-Longdendale, Cheshire. Probably collected by E.W. Binney. [Described by Binney, 1856a, b (*90, 91*) and figured by Sarjeant, 1974, p. 326].

STOCKPORT MUSEUM, VERNON PARK, STOCKPORT

Dr. R.M.C. Eagar (Manchester Museum) and Mr. Francis P. Galvin of Stockport courteously furnished the following details:

Chirotherium sp. Bunter Sandstone (Early Triassic) of a borehole near Stockport, Cheshire.

YORKSHIRE MUSEUM, YORKSHIRE

Y0870 and Y0871. "Footsteps", figured specimens. Forest Marble, "near Sutton, Wiltshire" (possibly Sutton Benger, near Bath, Wiltshire). William Reed Collection. [Described by Sarjeant, 1974, pp. 341-343].

SCOTLAND

HUNTERIAN MUSEUM, THE UNIVERSITY, GLASGOW

Iguanodon tracks. Freestone horizon in Purbeck Beds (Early Cretaceous), Norman's Quarry, Queensground, N.E. of Worth Matravers, Dorset. [Figured by Sarjeant, 1974, p. 356].

WALES

NATIONAL MUSEUM OF WALES, CARDIFF

1. *Anchisauripus thomasi* (Sollas) Haubold. Holotype. Dolomitic Conglomerate (Triassic), nr. Porthcawl, South Glamorgan. Collected by T.H. Thomas. [Described by Sollas, 1879 (*301*).
2. *Anchisauripus* sp. Figured specimens. Triassic (Norian), South Glamorgan. [Described by Tucker and Burchette, 1977].

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HAUBOLD, H. 1971. *Ichnia Amphibiorum et Reptiliorum Fossilium.* In: Handbuch der Paläoherpetologie/Encyclopedia of Paleoherpetology, Part 18. Oskar Kuhn (ed.) Stuttgart, Germany: Gustav Fisher Verlag, 1-124.

SARJEANT, W.A.S. 1974. A History and Bibliography of the Study of Fossil Vertebrate Footprints in the British Isles. Palaeogeog.Palaeoclimat., Palaeoecol., *16* No. 4, 265-379.

TUCKER, M.E. & BURCHETTE, T.P. 1977. Triassic Dinosaur Footprints from South Wales: Their Context and Preservation. Palaeogeog., Palaeoclimat., Palaeoecol., *22*, 195-208.

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LETTER TO THE EDITOR

I would like to draw the attention of your readers to some items currently offered for sale by the London dealers Gregory, Bottley and Lloyd. These are described in their 'Catalogue of Lomax Palaeobotanical Slides' and comprise some 200 palaeobotanical thin sections, manufactured by the Lomax Palaeobotanical Company of Bolton. These bear (it is claimed) "handwritten Lomax catalogue numbers". It is further claimed that they were "purchased in 1957 by Mr. E.P. Bottley from the Lomax family". I take issue with both of these claims as I believe them to be errors of misunderstanding developed over a period of nearly 30 years. None of the slides on offer were obtained by Bottley directly from the Lomax family and the numbering system on the slides has nothing to do with any Lomax.

The slides all bear stuck on labels with the digits 14.35 followed by a running number. In fact 14.35 is a Bolton Museum accession number given to the fourteenth accession of 1935 - a series of 334 palaeobotanical thin sections donated to the museum by a Mrs. H. Barnes of Bolton. The museum now has only 68 of these sections.

The fate of the missing 266 remained a mystery until 1978 when the writer discovered them, bearing their distinctive accession numbers, in the Chelsea showrooms of Gregory, Bottley & Co. Subsequently a letter from Mr. E.P. Bottley was found in the Bolton Museum files which indicated that his firm obtained a quantity of "fossil plant thin sections, ground type" from the museum in 1957. By way of exchange, he offered the museum £30 against future mineral specimen purchases. These sections, obtained by exchange in 1957, are, presumably, the series currently being offered for sale at an asking price of £3,500.

The real source of the sections has been confused because Bottley also obtained the residue of the Lomax business stock in 1957. He purchased this from the widow of Joseph Robert Lomax, son of the better known preparator James Lomax.

Having examined the Bottley 14.35 material once in 1978 and again more recently, it appeared that some of it was localised but none of it was (then) identified. It seems clear, therefore, that the Bolton curator of 1957 disposed of unpromising material from the 14.35 accession. The sections which remain at Bolton are all fully determined and comprise a small part of the museum's total holdings of Lomax material.

Personally I do not support the disposal of material from public collections (except in exceptional circumstances) and would in fact have repurchased these items had not the asking price been (in my opinion) much too high. The sight of ex-Bolton specimens on sale is, I find, very trying and quite irreconcilable with my professional sensibilities as curator of a publicly owned collection. The fact that erroneous information is given which may mislead prospective purchasers is even more disturbing and forms the main reason for this communication.

Alan Howell,
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Bolton.
BL1 1SA.

GCG-BCG JOINT STATEMENT ON THE GOVERNMENT'S PROPOSALS FOR THE ARTS FOLLOWING ABOLITION OF THE GLC & THE METROPOLITAN COUNTY COUNCILS

The Government's proposals to abolish the Metropolitan County Councils and the Greater London Council in 1986 will have profound affects on the funding of the museums and related artistic organisations which they support. Proposals for re-organising the funding and administration following the abolition were published on 7th October, 1983 in a white paper Streamlining the cities (cmnd 9063 HMSO, £3.60). On the same day a supplementary paper Abolition of the Greater London Council and the Metropolitan County Councils: The Government's proposals for the arts was published by the Office of Arts and Libraries. Views and comments on the proposals (directed to the Head of the Office of Arts and Libraries, Great George Street, London SW1) were invited to be received before the 31st January, 1984.

The proposals directly concern four institutions with natural history collections; the Horminan Museum, the Manchester Museum, Merseyside County Museum Service and Tyne and Wear County Council Museums. In view of the serious implications to these museums posed by the Government's proposals a joint BCG/GCG working party was set up to consider and comment on them. The resulting statement was submitted to the OALS in early December, 1983 and is reproduced below.

Streamlining the Cities

Joint Statement by the Biology Curators Group and Geological Curators Group

Introduction

The Biology and Geological Curators Groups were formed to improve the standard of natural science curation in museums and allied institutions. The membership of both groups includes curators from national, university, local authority and private museums.

Since their foundation in 1974/75 the Groups have done much to assess the size, importance and condition of natural science collections, and through the Federation of Natural Science Collection Research Units (FENSCORE) have initiated collaborative recording projects covering the whole country.

The two Groups are concerned, therefore, that any proposals for local government reform safeguard the future of natural science collections in museums, so that the public can continue to utilize them to their fullest extent in future years.

Accordingly, the Groups welcome the recognition in the consultation paper on 'The Government's proposals for the Arts' that certain museums have collections of wider than local significance and that their funding should be recognised as a national responsibility. However, we find it disturbing that all the institutions recognised are, with one exception, art galleries or art-orientated museums, and furthermore that neither the White Paper nor the consultation paper make any mention of the sciences. These omissions are the more unfortunate since natural science collections form the major part of many museums' collections and the natural history galleries are shown by many visitor surveys to be the most popular.

Services affected

There are three Metropolitan counties where museum services in natural sciences are likely to be particularly affected by the Government's proposals. These are the services provided by the County Councils in Tyne and Wear, Merseyside and Greater Manchester (via the funding provided by the Greater Manchester Council to the Manchester Museum). In addition, the Horniman Museum, with its department of natural history, is currently administered by the Greater London Council (GLC) through the Inner London Education Authority. The Museums and Services provided by these Councils are all very different to each other, but the reasons which made them eligible for county funding in 1974 are in every respect valid today. During these nine years of administration or funding by the Metropolitan County Councils and the GLC, efficient and cost effective services have developed. The groups are, therefore, most concerned at the proposals to abolish these county councils and to return their museums, with the exception of the Horniman, to District Councils.

All the museums offer services of much greater significance than that of a District, and although the Government have stated their intention to reassess the block grant provision and the grant-related expenditure for museum services to ensure that District Councils can bear the cost of taking over responsibility, the groups have grave doubts as to whether the reassessment will be sufficient to maintain the existing services. Even if the Districts were to receive enough after reassessment to run the museum services at their existing level, there must be reasonable doubt as to whether they would spend it on museum services in circumstances where priorities may be directed towards housing, social services and education. In Tyne and Wear especially, but also elsewhere, it will involve a high degree of collaboration, which we fear may not be forthcoming.

It appears to the Groups that a large funding gap will emerge, and it seems most unlikely that other neighbouring districts would feel inclined to contribute or that voluntary contributions and other funding sources would make good the deficit.

Bearing in mind the differences in the services offered and the doubts expressed above, the Groups feel that an outline of the services in natural sciences offered by each museum may lead to a better understanding of the problem. (Details of each museum were included in an appendix not reproduced here).

Conclusions

It is the view of the Biology and Geological Curators Groups that the Metropolitan County Councils and the GLC have provided a sound basis for the funding and administration of museum services with more than local significance.

In Tyne and Wear a series of small museums have been grouped together to form a coherent service. In this way they can share the services of curatorial and conservation staff which, as individual museums, they found difficult to justify. Clearly, as there is a responsibility to safeguard their collections and make them available to the public, the most sensible and cost effective system is through a county-wide service.

The Government has recognised the importance of the Horniman Museum, but to make the museum the responsibility of the trustees of the British Museum, where there is no expertise in natural history, is to disregard the significance of the Horniman's natural history collections. In view of the existence of other museum services in the Greater London Council area it seems sensible that a unified structure should be established for their administration. We therefore commend for serious consideration the recommendation of the Area Museum Service for South East England that a Joint Board for Museums, Arts and Recreation in London be established.

The Merseyside County Museums and the Manchester Museum are two of the country's most outstanding museums and the two Curators' Groups find it astonishing that the consultation paper does not recognise them as of national importance. The size and importance of their collections, together with the nature of the services offered, extend beyond, not only the local authority districts in which they are situated, but beyond the administrative areas of the present Merseyside and Greater Manchester County Councils. Indeed, on a European scale they are two of a small number of institutions recognised by the European Science Foundation [1] as having collections of national importance. Furthermore, the Advisory Board for the Research Councils made it clear in their report [2] (Recommendation 6) that resources should be made available for their curation. In view of their importance to the nation, it would be quite unfair to give this responsibility to local authorities at district level, and these museums should be recognised as institutions of national importance and receive appropriate central government funding.

The Groups have refrained from making detailed comment on present or future financial provision for a number of reasons. However, we feel that county-wide services should not be administered or financed by a single District and museums such as the Manchester and Merseyside County Museums with national significance, should receive additional funding from central government. In this context the Museums and Galleries Commission would appear to be the appropriate body to negotiate and channel such funds to the museums concerned.

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2. Smith, E., chairman, (1977). Taxonomy in Britain. Report by the Review Group on Taxonomy set up by the Advisory Board for the Research Councils. HMSO.

Biology Curators Group,
Geological Curators Group,
November, 1983.

NOTES & NEWS

compiled by Tony Cross

NATIONAL STONE CENTRE LAUNCHED

The formation of a National Stone Centre took a significant step forward today (25th November, 1983) when the project was officially launched in London by Sir George Young, Parliamentary Under-Secretary of State, Department of the Environment.

The Centre, to be established at Wirksworth, Derbyshire, is envisaged as an information point for both the public and all those connected with the stone industry. It will relate to all types of stone quarried in the United Kingdom, whether it is used for building or, in crushed form, for the production of concrete, the making of raods or in industrial processes.

The site earmarked for the Centre - the Colehill complex of six abandoned quarries and limekilns - was selected from nearly a hundred other locations, using a stringent set of criteria. The area is already well known to geologists (Editor: Additional Information) and provides many opportunities to explore the history of the industry and its modern counterparts.

The site could not be better situated, located as it is in the largest stone producing county with further important centres to the north and south, within two hours travelling time of half the population of England and Wales and within 50 miles of over 30 universities, polytechnics and colleges offering courses relevant to some aspect of the industry. In the local context, the site straddles possibly the most heavily used footpath in this tourist county, is flanked by active quarrying operations and lies on the outskirts of Wirksworth, the town which last year won the Europa Nostra Award.

The National Stone Centre is seen as an attraction for both day visitors and longer stay tourists, for researchers, for educational visits by schools and colleges, a venue for exhibitions, demonstrations and permanent displays, a reference centre for technical and historical information and, in the longer term, perhaps a potential site for trade federations and professional bodies associated with the industry. Alongside the Stone Centre, it is proposed to develop a Stone Trade Centre, as a national shop window for industry's products and as a base for those servicing this sector.

The Study Group, which has been laying plans for the Centre since 1981, includes representatives from Derbyshire County Council, from the educational architectural and industrial fields. Their work has been actively supported by all the main sectors of the stone industry, local government at all levels, central government agencies and various interest groups. Representatives of all these bodies have now joined together to form a Promotion Committee which includes amongst its members Her Grace the Duchess of Devonshire and Lord John Manners.

The London launch - held at the RIBA Conference Centre - is intended to generate commitment along a wide range of grant-aiding bodies and other interested parties to the establishment and running of the Centre, which will be operated as a company limited by guarantee, registered as a charity.

It is proposed that Derbyshire County Council will acquire the 50 acre site

next year in order to undertake sensitive reclamation work and make rock faces safe before handing it over to the Stone Centre on a long term lease.

Editors note. The secretary Ian Thomas can be contacted for further details and for a Prospectus for Development.

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Additional Information

Education and the Environmental Sciences

The wealth of geological, historical and ecological resources on the Colehill site is seen as providing a microcosm of the exploitation of stone nationally and as such presents an immense educational potential. Interpretation of the development and inter-dependence of these diverse resources will ensure that this potential is fully realised. Some idea of the range of curriculum topics is apparent from a basic checklist, a more detailed inventory only serves to strengthen the use of the resources of the Stone Centre. Where else in this country, or abroad, can parties from across the formal and informal spectrum of education find such a wide range of quarries, mines, significant geological features, limekilns, railways, vernacular architecture, quarry plant and machinery and ecological associations? These site features will be interpreted in a range of displays. This interpretation can be seen as a starting point for studies, supplemented with archives, reference and handling material, of local, regional and national geology, rock types, quarrying techniques both historical and modern, processing, distribution, social and economic history of the industry and the applied arts.

This educational role may be further extended through the representative collection of dimensional stone and aggregates providing a shop window reference for stone users within building and allied trades.

Within 40-50 miles of Derbyshire there are universities, polytechnics and colleges with courses in geology, mining, quarrying, landscape architecture, resource planning or related subjects at Manchester, Liverpool, Stoke, Crewe, Birmingham, Leicester, Derby, Nottingham, Sheffield, Leeds and Doncaster, over 30 institutions in total. Of particular note is Doncaster College of Technology which supports the only course directly related to quarry management. This includes studies sponsored by the Institute of Quarrying which in large measure form the recognised qualification for quarrying managers and certain other professionals within the industry.

It is therefore proposed to offer facilities for study and research, and field base for seminars and small conferences and a series of technical advisory services from the Centre.

In terms of geology alone, the site is worthy of national status, containing as it does what is widely acknowledged to be probably the best readily accessible teaching examples of a limestone reef complex together with associated fossil and rock assemblages. The forereef (offshore), the reef core, and the back-reef on lagoonal beds are all beautifully exposed over a distance of a few hundred metres. Within a mile of the site are good examples of sandstone, dolomite, igneous rock and vein mineral exposures complementing the limestone and mudstone sequence on site. The site is already much used, by students and school parties from as far away as Devon and Aberdeen. Although the site is a designated Site of Special Scientific Interest it is not otherwise safeguarded and much of this use is unofficial.

The site and its immediate neighbourhood are of considerable interest to the industrial historian. The close ties between the development of the quarrying industry and roads, railways and canals of different periods is well demonstrated. The changing scale of quarrying and its products, from the much celebrated Hoptonwood Stone worked as far back as the eighteenth century for buildings such as Kedleston Hall, in nearby Middleton, to the last large scale workings on the site, related to the construction of the M1, can be told, as can the fascinating history of lime-burning, from the farmers' field kiln through to highly controlled, modern plants.

At a local level, the is much frequented by botanists and ornithologists. One feature which the Centre hopes to demonstrate is the way in which former workings become colonised by wildlife and the measures which can be taken to alleviate some of the conflicts between the extractive industries and the environment.

Within the industry, in the planning and academic sectors there are thus many people within a reasonable travelling distance of the site, or who earn their living from the industry, are studying or require training in fields which relate directly to the aims of the Centre. It is also clear from support already expressed that this interest ranges well beyond local or regional boundaries, and that a National Centre is long overdue.

MARINE REPTILES FROM THE UPPER LIAS OF THE YORKSHIRE COAST

Mike Taylor (Bristol City Museum) and I have written a paper on the history of collection and stratigraphic distribution of ichthyosaurs, plesiosaurs and crocodiles in the Upper Lias of the Yorkshire coast (Proc. Yorkshire geol. Soc., 44(4), December, 1983). The first recorded fossil "allegator" from Whitby was found in 1758, and since then, several hundred reptiles have been collected from the coast between Whitby and Saltwick, at Hawsker, and in old alum worldings at Kettleness, Loftus, Sandsend and Runswick. Only very few specimens have been found in the Lower and Middle Lias. We examined over 150 specimens in British museums and attempted to assign them to exact localities and horizons by studying matrix, associated ammonites and archives. This was difficult in most cases. It became evident that published designations were often wrong and that a great deal of valuable locality data has been lost. We compared the marine reptiles from the Yorkshire coast with those from the Upper Lias of Holzmaden, SW Germany where detailed provenance data have been recorded, and we concluded that better collecting practices for fossil vertebrates are required in this country.

We urge future collectors to record both locality (8-figure National Grid Reference) and horizon (ammonite zone and the exact bed, using a published account, when available), as well as taphonomic data (e.g. completeness of skeleton, orientation and position of burial, state of articulation, relationships of bones to sediment, condition of bones). This is the responsibility of every informed collector and of museum curators who are given specimens by amateur collectors. An important fund of data has been lost because collecting details have rarely been recorded, and we must not continue to behave in this destructive way.

Michael J. Benton, University Museum, Parks Road, Oxford, OX1 3PW.

"The joke is that if some smart aleck finds one of our fossilised 12 in. claws in 125 million years' time, he'll assume we were gigantic flesh-eating dinosaurs."

Reproduced from the Eastern Daily Press July, 1983

'Lack of sex killed dinosaur'

DINOSAURS may have ruled the Earth—but their sex lives seem to have gone from bad to worse.'

The Observer

WHOSE SAURIAN NOW?

Alan Coren: A SHORT HISTORY OF MESOZOIC SEX

The Triassic Period

Two hundred and twenty-five million years ago, there was not a hell of a lot to do.

The earth consisted of one huge continent, covered in moss and surrounded by a single ocean. It was from this ocean that those creatures emerged which were ultimately to evolve into the first dinosaurs, and they were a pretty happy and undemanding crowd. Most days, they either looked at the moss, or they made love. It was only much later that they found themselves doing both at the same time.

Basically, these first animals were fish with little legs, and that in itself was no small contributory factor to their contentment: hopping about was a whole new experience. Not that they hopped far; the leg itself was a new enough phenomenon for its owner not to be entirely certain that it might not vanish again, and nobody wanted to find himself as a legless fish stranded far—it could be yards—from his loved ones. Gradually, however, confidence grew, legs lengthened and strengthened, and, within a mere eon or so, more protracted hopping began, followed rapidly by adultery.

Not that this was any major cause of social or marital division. The sexual act had no great significance to the prehistoric reptile, it was simply the thing that wasn't moss. But perhaps the most important fact to remember was that all these creatures looked exactly alike: marital misconduct proceeded not from dissatisfaction but from unawareness. You might as well view the movement from one patch of moss to another as being unfaithful to dinner.

All this, however, was to change by the second half of the Triassic period. Primitive seed plants called cycads had evolved, and trees began to grow up along the river banks, and spread inland, evolving as they went. Pretty soon, there were bushes everywhere, and more than a few flowers.

The flowers looked good to eat. They weren't, but that didn't stop the Triassic citizens taking a crack at it. What motivated them was called desire.

And the citizens themselves were changing. Having been fish with little legs for millions of years, some of the smarter ones had had enough. Apart from anything else, they wanted to look over the bushes, to see if there were any more of those good-looking flowers about for lunch. So legs grew even longer, and the great plant-eating sauropods began, during the next thirty million years or so, to rise above the bushes and peer over them with their new long necks.

Whereupon they discovered not only new and good-looking food, they also found new and good-looking sauropods.

With their new big legs, they jumped over the bushes, and began to run.

The Jurassic Period

By one hundred and fifty million years ago, much had changed. The climate was wetter and hotter, the seas were warm and clear, and there were some really fashionable swamps.

And suddenly, almost, the Earth was full of millions of different creatures: sexually speaking, choice had taken a quantum leap forward. There were camptosaurs and coelurosaurs and carnosaurs, there were apatosaurs and ornitholestes and protoceratops, and there was nothing to do all day except work your way through them alphabetically until either (a) you found something that took your fancy, or (b) you found something that took your head off.

This, then, was the highpoint of the saurian culture. The dinosaurs of the mid-Jurassic, big, dim, and cheery, lived a life of sybaritic experimentation, spiced with risk and free from guilt. Life was, in short, like an eon in Benidorm.

It was not, of course, to last.

The Cretaceous Period

Around one hundred million years ago, the first dark clouds started to gather above the saurian Eden. The continents began to assume their modern shapes, locally specific climates and flora emerged, and major physical and personality differences opened up between the reptilian sub-species. Rapid and fundamental changes in habitat bred insecurities, fears, and neurasthenic twitches: a sea would suddenly appear beneath your feet, a redwood forest would spring up behind your back, a big bang would take the top off a favourite mountain and nasty stuff would gush out. Seasons developed: stand around ruminating too long, and you would go white and vanish.

Thus it was that more and more dinosaurs had trouble sleeping; it may be argued that, compared with what besets us his heirs, the above worries do not seem much to have on your mind. But with a mind the size of a cobnut, it doesn't *take* much. Naturally, the saurian sex-life was the first thing to suffer, their new preoccupations and their inability to adapt to environmental changes being compounded by the sad truth that after sixty million years of copulatory fun, the whole thing was beginning to pall, anyway.

Couplings became far more infrequent: the paucity of fossil remains from the period c.90,000,000–c.80,000,000 BC suggest that many dinosaurs chucked in the sexual sponge altogether, probably in favour of canasta and flower-arrangement. From the disposition of bones in Southern Arizona, we know that a measure of dinosaur-swopping went on, since there is no other way in which evolution could have arrived at the corythosaurus, which was a duck-billed ornithopod with the tail of a brachiosaur, the hindquarters of an iguanodon, and the forearms of a psittacaurus. It was not unlike the Ford Edsel, and almost certainly gay. We can infer this from the fossilized footprints, which show a marked mince.

Further evidence of sexual disorder and decline may be gleaned from the remains of Cretaceous females, which for the first time have teeth equally powerful with the males. Clearly, they were no longer happy about role-imprinting, wanted an equal part in an ongoing meaningful relationship, and almost certainly took casual work snapping things off and rooting things up. The teeth would also have been of no small value in backing up headache claims. Similarly, sexual harassment would have been given short shrift: fragments of male bone appear with depressing frequency after c.60,000,000 BC.

What is beyond question is that the dinosaurs of the late Cretaceous were growing rapidly more ugly. The smooth, lissom, many would say fetching, brontosaurs of earlier eons had by now disappeared entirely, leaving the planet populated by giant horned, scaled, fanged and clawed grotesqueries like stegasaurus, styracosaurus, triceratops, polacanthus, tyrannosaurus and monoclonius. They were walking arms complexes, they looked like something doodled on his sketch-pad by Rommel after a night hitting the Domestos bottle, any sexual encounter which any of them was dumb, desperate, or suicidal to risk took on most of the salient features of the battle for Stalingrad. Copulation, already, as we have seen, infrequent through a variety of social stresses, now became a thing of often mortal fumbling, as the giant panzers sought desperately to find their own or their partner's relevant parts in the armoured impregnability of their fearful undersides.

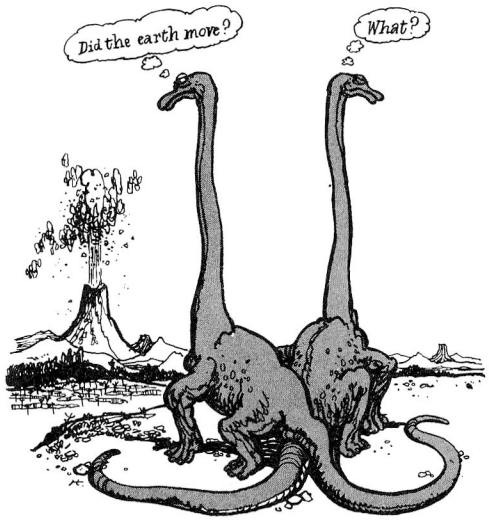
Once a year was about par for the course.

Naturally enough, the dinosaurs attempted to convince themselves that the new conventions were an immeasurable improvement on the old, and that the progression from love between males and females to armed conflict between males and females was a natural evolutionary step to be welcomed and encouraged in the name of moral and spiritual health.

As far as we can judge, it was a belief they held until the very end.

PUNCH, July 21 1982

Reproduced from Punch 21st July, 1982



BRACHIOSAURUS was the dinosaur with the largest body and the smallest brain: such was the immense distance between its reproductive organs and its tiny cranium, it tended to have sex without realising it, and then immediately forget what had happened. Even if it had enjoyed the experience enough to want to repeat it, it could never remember what it was that it wanted to repeat. Males would often meet females, and both would experience a vague sense of occasion, staring desperately at one another until their heads began to droop. They would then part, wondering which one of them had been the tree.

TRICERATOPS was perhaps the most tragic of the dinosaurs, being unquestionably the most repulsive, even by its own poignantly undemanding standards. A victim of its own evolution, it continued, pointlessly, to refine its disgusting physiognomy from something which sensibly repelled its enemies into something which finally repelled itself. A male triceratops would meet a female triceratops and, quite frankly, refuse to believe what it saw. For a while, each would make polite noises about minds being more important than appearances, they would discover all sorts of hobbies they had in common, they would agree to meet for a second date, and then they would go their separate ways and throw up.

PTERANODON was the largest of the winged dinosaurs, and was always flying abroad on business. What with the inevitable worries and pressures of this stressful career, the permanent flight-lag, the strange foreign food, the constant preoccupation with the whereabouts of its luggage, and the not inconsiderable fact that its style of flight (*see illus.*) exposed its private parts to every inclemency of weather and altitude, the pteranodon eventually gave up sex altogether. For a time, it continued to bring perfume and small breakable souvenirs back to its mate, but these were of little evolutionary help to either of them. Recent fossil excavations suggest that the last pteranodon died of exhaustion over what is now Gatwick.

TYRANNOSAURUS REX was, as its name indicates, the most powerful, the most arrogant, the most domineering, and the most egocentric of the dinosaurs. It is interesting primarily for the fact that it was probably the first animal (though not the last) to evolve sexual condescension into a suicide weapon. For 99.9% of the Cretaceous week, tyrannosaurus rex would kill anything that moved, eat anything that didn't, break up the landscape, laugh at its own lousy jokes, belch, scratch, snore, pull the hairs out of its nostrils, and go to lodge meetings. In the five hebdomadal minutes remaining (usually on Saturday night), it would suddenly leap on tyrannosaurus regina with terrible ineptitude. Finally, tyrannosaurus regina left, saying she had had enough. Or, in some cases, not enough.

RECENT PUBLICATIONS

RADIATION HAZARDS TO COLLECTORS OF GEOLOGICAL SPECIMENS CONTAINING NATURAL RADIOACTIVITY NRPB-R131

D W Dixon

ABSTRACT

Geological specimens containing significant amounts of radioactivity are available to collectors from specialist suppliers and by collection in the UK. Radiation levels associated with radioactive samples have been measured and assumptions made about handling procedures to estimate the hazards of radiation exposure.

Samples ranged from UK collected specimens containing relatively small amounts of activity to high quality specimens such as uraninite containing over fifty percent by weight of uranium-238. The results of measurements of specific activity, dose rate, radon exhalation and loose activity showed that they can be high enough to warrant consideration of the hazards. Although generally less active than high quality samples, UK collected samples can have specific activities comparable to those from some high quality specimens.

Exposures from external irradiation, inhalation of radon-222 daughters and ingestion of activity have been evaluated. The exposures by each of these mechanisms are small and correspond in total to a few per cent of the dose equivalent limit for members of the public caused mainly by high quality specimens such as uraninite.

Radiation exposures can be reduced by minimising handling time, removing loose activity from hands by washing and storing specimens in an unoccupied place.

National Radiological Protection Board
Chilton
Didcot
Oxon

January 1983

HSMO, £2.00 ISBN 0 85951 174 X

Faber D.J. (Editor) 1983. Proceedings of the 1981 workshop on care and maintenance of Natural History Collections Syllogeus, No. 4 published by the National Museum of Natural Sciences, National Museums of Canada. 196pp.

I am grateful to Gerald R. Fitzgerald, at the National Museum for bringing to my attention this useful and interesting publication. The articles making up the publication are grouped under major headings and cover the whole range of the Natural Sciences. The headings and selected articles of geological interest are listed below.

Collection of specimens
Preparation of specimens
Storage of specimens

> The wet-epoxy-surface technique of casting with pour-in-place polyurothane foam by G. Fitzgerald. Casting fossil footprints in a limited-access time location by R. Grantham.
>
> Relocation of the Royal Ontario Museum's invertebrate palaeontology collections, 1981 by J. Waddington and D. Rudkin.

Documentation of specimens
Miscellaneous papers
Appendix A Selected bibliography on care and maintenance of natural history collections.
Appendix B Report on questionnaire concerning care and maintenance of natural history collections (in Canada).

Copies of this publication can be obtained free of charge on application to G.R. Fitzgerald, Curatorial Assistant, National Museums of Canada, National Museum of Natural Sciences, Paleobiology division, 1767 Woodward Drive, Ottawa, Ontario K1A OMB, Canada.

'STOP PRESS'

LUDLOW MEETING

Friday, 8th and Saturday, 9th June 1984

Department of Natural Sciences, Shropshire County Museum Service, Old Street, Ludlow

PROVISIONAL PROGRAMME

Friday morning

10.30 a.m.	Coffee
11.00 a.m.	The history of Ludlow Museum 1833-1984 - John Norton (Curator of Ludlow Museum)
11.45 a.m.	Tour of the geological collections in the Museum.
12.45 p.m.	LUNCH at local hostelries.

Afternoon

2.00 p.m.	The work of geologists in the Welsh Borderland - Dr. Hugh Torrens (Keele University)
2.30 p.m.	Pastoral work on geological collections in Shropshire & the West Midlands - Tristram Besterman (Warwickshire Museum).
3.00 p.m.	Recent excavations in the Lower Old Red Sandstone of the Morville Area - Dr. Chris Cleal, Maggie Rowlands and Peter Tarrant.
3.30 p.m.	TEA
3.45 p.m.	The geological heritage in museums - Phil Doughty (Ulster Museum).
4.30 p.m.	Finish of session and registration at hotel.

Evening (Subject to confirmation)

Reception (with refreshments) at premises to be used for rehousing Ludlow Museum and Library.

FIELD TRIP

Saturday Morning (Leaders. Peter Cross & John Norton).

9.30 a.m.	Site visit to Downton Gorge where Peter Cross will demonstrate features of the glacial geology. Then on to Church Hill, Leintwardine where the unusual fauna of the Silurian Lower Leintwardine Beds (upper division) deposited in submarine canyon heads will be examined. The fauna here includes giant eurypterids, phyllocarid crustaceans, beautifully preserved echinoderms together with graptolites.
LUNCH	At the Compasses Hotel Wigmore.

Saturday Afternoon

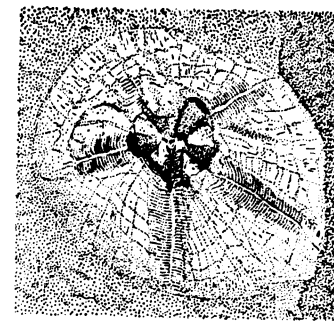
The Silurian rocks of the Ludlow Anticline. Excellent exposures spanning the succession between the Wenlockian through to the Downtonian.

Accommodation will either be at the Croft Guest House (bed and breakfast £8.00) or at the Cliff Hotel (bed and breakfast £10.00). Depending on numbers transport will either be by coach or by private car.

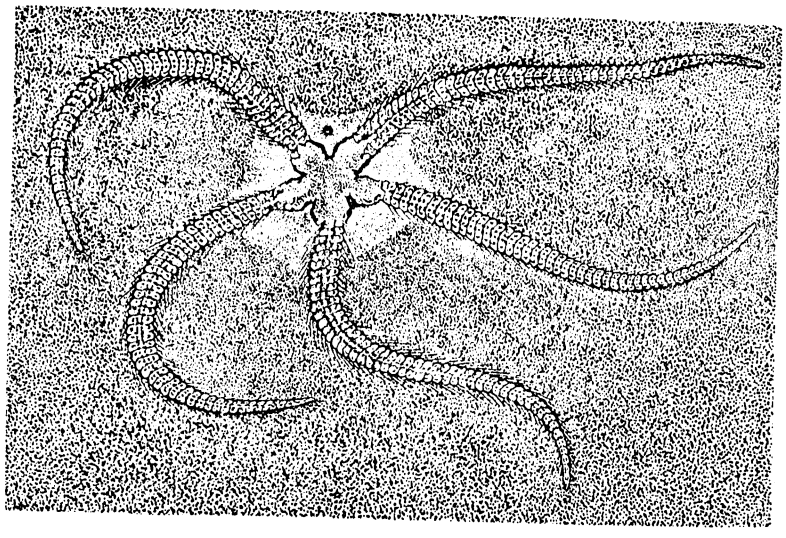
Please indicate if you intend to come by completing the enclosed slip. We need to know approximate numbers in good time to enable a provisional booking to be made at the hotel/guest house.

Local Secretary: John Norton,
The Museum,
Ludlow,
Shropshire.

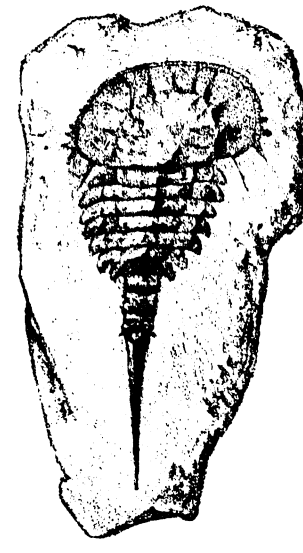
Telephone: Ludlow (0584) 3857



Palaeodiscus ferox Salter



Lapworthura miltoni (Salter)



Hemiaspis limuloides Woodward

Fossils from the Silurian Leintwardine Beds at Church Hill, Leintwardine.

GEOLOGICAL CURATORS GROUP

(affiliated to the Geological Society of London)

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Geoff Tresise.

THE GEOLOGICAL CURATORS GROUP

The purpose of the Group is to improve the status of geology in museums and similar institutions, and to improve the standard of geological curation in general, by:

- holding meetings to promote the exchange of information

- providing information and advice on all matters relating to geology in museums

- the surveillance of collections of geological specimens and information with a view to ensuring their well being

- the preparation of a code of practice for the curation and deployment of collections

- the advancement of the documentation and conservation of geological sites

- initiating and conducting surveys relating to the aims of the Group