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## Biology Curators Group Newsletter

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# FEATURED INSTITUTION

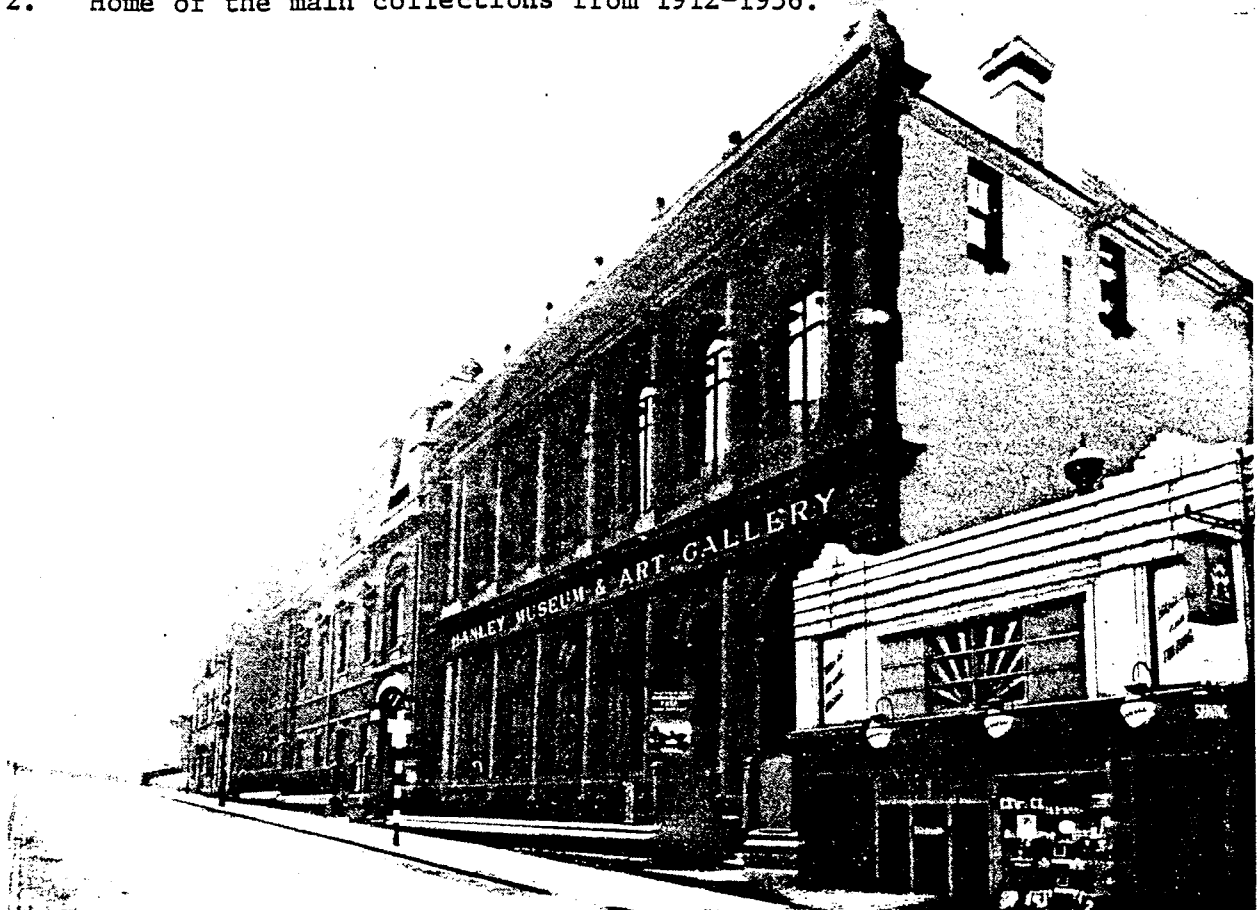
## STOKE-ON-TRENT CITY MUSEUM AND ART GALLERY

### NATURAL HISTORY SECTION

		Page
Introduction	Geoff Halfpenny	274
Botany	Geoff Halfpenny	285
Invertebrate Zoology		289
Insects	Geoff Halfpenny	
Other invertebrates	Don Steward	
Vertebrate Zoology		292
Fish	Don Steward	
Amphibians, Reptiles	Geoff Halfpenny	
Birds	Geoff Halfpenny	
Eggs	Don Steward	
Mammals	Geoff Halfpenny	
Osteology	Don Steward	
Aquaria	Don Steward	295
Alphabetical list of major collectors/donors	Geoff Halfpenny	297

2. Home of the main collections from 1912-1956.

Demolished in 1974.



The format of this article is based largely on that of the Sheffield City Museums (Riley et al 1982) though the collections data is organized according to our internal classification system (Halfpenny 1982, see elsewhere in this newsletter).

Arnold Bennett highlights something of the complexity of Stoke-on-Trent in his novel 'Anna of the Five Towns' (1902). In reality the City comprises six towns (Tunstall, Burslem, Hanley, Stoke, Fenton, Longton) each with its own administrative centre and at one time its own museum (Greenwood 1888, Museums Association 1931, Markham 1948, Bemrose 1953, Standing Commission on Museums and Galleries 1963, Black 1971).

Unfortunately, the dates of establishment of the museums as quoted in the references are rather conflicting. For example Hanley is variously listed as having been founded in 1826 (Museums Association 1931, Markham 1948) 1887 (Greenwood 1888, Bemrose 1953) and 1890 (Standing Commission on Museums and Galleries 1963). I believe 1826 to be the most likely date as it marks the foundation of the Mechanics Institute which replaced the Potteries Philosophical Society previously formed in 1819.

Hanley therefore represents the earliest museum in the area and for the purposes of this article the most important as it was here in 1908 that the North Staffordshire Field Club cooperated with the Hanley Corporation in the provision of a natural history museum (NSFCT 1908/09(a), City of Stoke-on-Trent 1926, Bemrose 1936).

1910 saw the Federation of the six towns and centralization began under the Libraries, Museums and Gymnasiums Committee. Hanley became the centre and on the outbreak of World War II was the only museum retaining a small display, the bulk of the collections having been evacuated to the country for safekeeping.

After 1945 sections of the permanent collections were displayed once more but the existing building was in a very bad state of repair and alternative accommodation (the need for which had been realised in the 1930's) was required (Bemrose 1953).

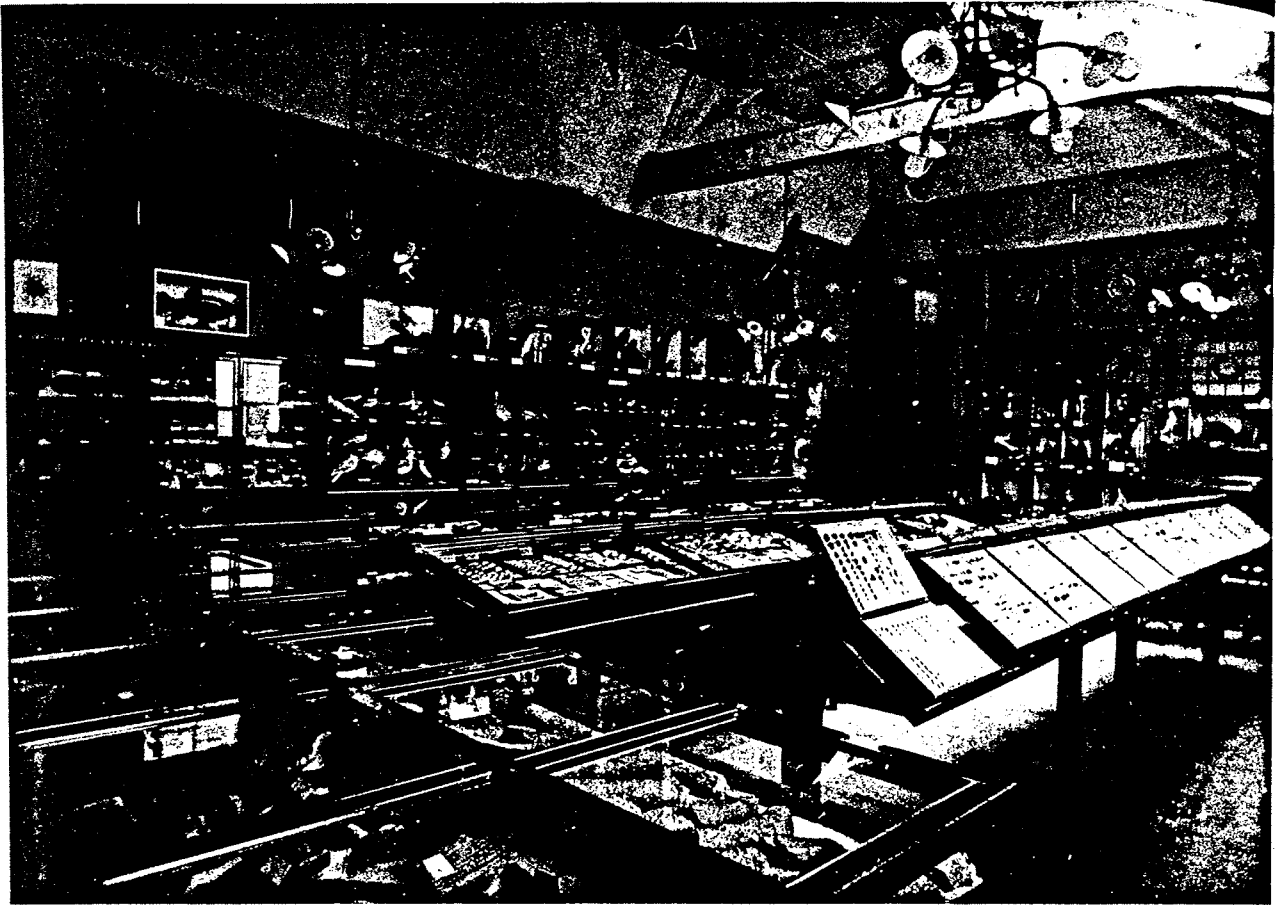
Work on a new building finally started in February 1955 (Sentinel 1955) and in October 1956 the City became the first Authority in Britain to build a new post-war museum (Sentinel 1956). Natural history was not redisplayed until 1960 when a small section was opened by the Deputy Lord Mayor Alderman S. Capewell (Sentinel 1960).

The 1956 building was always seen as the first phase of a larger development and in 1975 the Museum closed for the completion of the project. The new premises (which completely engulfed the earlier building) had a partial reopening in September 1979 and the entire building was officially opened by H.R.H. The Prince of Wales on 3rd June 1981. The much coveted Museum of the Year Award was received in 1982.

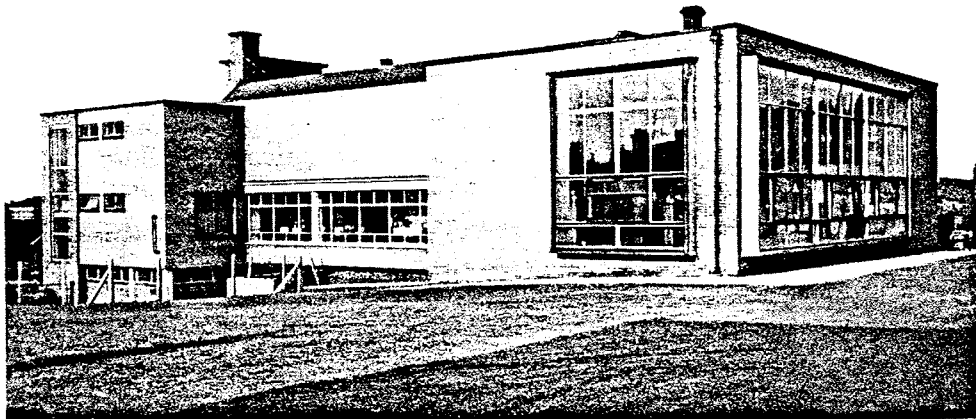
### Staff

Prior to 1910 the various museums were run by honorary curators or librarians and evidence of them and their activities have proved very difficult to trace.

An early Curator of the Hanley Museum was Louis H. Jahn who saw it through the initial post-Federation days before his death in 1911. Jahn was a keen entomologist and an active member of the North Staffordshire Field Club having



3. Displays pre-1956.



CITY OF STOKE-ON-TRENT MUSEUM AND ART GALLERY

4. The 1956 building.

become a member in 1871. He later became a council member of the Field Club and was elected Vice President in 1907 (NSFCT 1904/05(a) and 1906/07(a)). In 1909 Jahn was awarded the Garner Medal (a celebrated award commemorating the achievements of a great Staffordshire naturalist) for his interest in the entomological work of the Club, especially in connection with the Order Coleoptera (NSFCT 1908/09(b)). In addition to general notes in the zoology section report of the Field Club's Transactions Jahn produced two lengthier articles on Coleoptera (NSFCT 1904/05(b) and 1906/07(b)).

On the death of Jahn the Museum was temporarily the responsibility of the Hanley Librarian Mr. A. J. Millward.

Later in 1911 Mr. Alf J. Caddie F.R. Hist. S., Librarian and Curator of the Stoke Museum (since 1890's) was asked to take charge of all the Borough Museums and this he did until 1923. Caddie appears to have been a Librarian keenly interested in developing strong links between Libraries and Museums and pressured for centralization (Sentinel 1902, Caddie 1905, 1907, 1910, Sentinel 1917). As far as I can ascertain he did not show any interest in natural history.

At a special meeting of the Libraries and Museums Committee on 18th June 1923, Mr. G. M. Forsyth then Superintendent of Art Education in Stoke-on-Trent took temporary charge of the Museum. Although an October meeting wished to appoint Mr. Forsyth as consulting Curator and the Librarian Mr. Averill as Curator in Charge this was not to be as the Education Committee would not agree. Mr. Averill was requested to continue his duties.

On 3rd March 1924 Mr. F. Lambert M.A., F.S.A. was appointed Curator, a post, which he held for three years before moving to take up the Directorship of the City Art Gallery, Leeds in July 1927. Lambert was elected to Council of the Field Club in 1925 (NSFCT 1924/25).

From October 1927 until July 1930 the Curator was Mr. H. W. Maxwell previously Secretary of the British Institute of Industrial Art. Mr. Maxwell later became Director of the Bristol Museum and Art Gallery.

A definite change now takes place and a service which had seen seven men at the top in the previous twenty years now comes through to the present day with two.

Mr. G. J. V. Bemrose took up the post of Curator in December 1930 having come to Hanley from Leicester Museum and Art Gallery. His curatorship lasted until his retirement in 1962 during which time he had seen the service develop apace and had received much recognition for his work. He was Chairman of the Archaeology and History section of the N.S.F.C. from 1942-1963, Vice President in 1935 and in 1959 was awarded the Garner Medal for his contributions to the study of local history and for his general service to the Club (NSFCT 1958/59(a)). Mr. Bemrose became President of the North Western Federation of Museums in 1935 (Sentinel 1935). Whilst interested in natural history and a keen botanist we only possess an annotated copy of a County Flora and a few records in the NSFCT as evidence of this interest. On his retirement Mr. Bemrose returned to Leicestershire where I believe he redeveloped his botanical enthusiasm (Personal communication with I. M. Evans, Leicester Museums Service).

Our present Director, Mr. A. R. Mountford M.A., F.S.A., F.M.A. began working at the City Museum and Art Gallery as Assistant Curator in 1949 and succeeded to the Curatorship, later Directorship in July 1962. As a ceramics expert of international repute he has a general interest in natural history and has certainly supported the activities of the section during the author's time at

the Museum. Mr. Mountford has also been deeply involved with the N.S.F.C. having been the Club's Honorary Librarian from 1950-1962 and Vice President in 1959-1961 (NSFCT 1958/59(b)). In 1960 Mr. Mountford was awarded the Garner Medal in recognition of his outstanding contributions to the study of Archaeology (NSFCT 1959/60) and in 1963 succeeded Mr. Bemrose to the Chairmanship of the Archaeology section, a post which he held until 1972.

#### Natural History Staff

Very few Museum staff have been employed solely to curate the natural history collections.

B. Bryan	1920's-c.1944
R. Bailes	1938-1940
J. Henthorne	c.1948-1950
G. W. Elliott	1953-1978
R. Leigh	1963-1965
G. Halfpenny	1967-present
D. I. Steward	1978-present

From the early 1920's to his retirement c.1944 Mr. Bert Bryan a keen naturalist and active member of the N.S.F.C. not only carried out a Museum Assistant's role but also took sole charge of the Museum in the intervals between curators.

Mr. Bryan had been contributing to the zoology section reports of the N.S.F.C. since 1904 but does not appear as a member until 1911. He had catholic tastes but is particularly noted for his work on bats, bumblebees, amphibians and reptiles. An early publication of his in the NSFCT deals with the wildlife near his home (NSFCT 1910/11). Mr. Bryan was to hold various positions in the Field Club. Council member, 1925, Life Vice President and finally President 1941-1942 (NSFCT 1941/42(a)). His presidential address was on a natural history topic (NSFCT 1941/42(b)). He became Chairman of the Zoology Section of the Field Club in 1932 and held the post until 1949.

Ronald Bailes joined the staff straight from Hanley High School and only stayed a short period before joining the R.A.F. in 1940 at the age of 22. He was commissioned in Canada and was tragically killed in action in 1943.

John Henthorne also stayed for a short time only before entering the teaching profession and later emigrating to Australia.

Gordon Elliott joined the staff straight from school and whilst originally appointed as a natural history assistant very soon developed interests in archaeology and was later to become first assistant and an authority on Ceramics. He left the Museum in 1978 to take up a lecturing post at the North Staffordshire Polytechnic where he is presently Area Leader in Ceramic History.

Robert Leigh only had a brief spell at the Museum before starting up a business selling pottery.

The author joined the staff straight from High School on 1st October 1967, having seen the post advertised whilst waiting to enter Teachers Training College. As an enthusiastic amateur naturalist the position offered a superb opportunity to pursue his interests. He has been responsible for resurrecting a moribund section to the hive of activity it is today. He has a particular interest in

mammals, especially bats but retains an enthusiasm for most biological groups.

The title of Keeper for Museum Assistants in charge of sections was adopted in April 1978.

Donald Ian Steward joined the staff as Assistant Keeper of Natural History on 1st July 1978 having previously worked at the City of Bristol Museum and Art Gallery. Whilst primarily appointed for his geological expertise Don's combined interests and qualifications in geology and zoology have enabled an effective coverage of groups to be achieved as will be seen from the collection notes which follow.

### Collections

As natural history sections encompass different disciplines in different institutions I must first of all state that at Stoke the section includes geology in addition to botany and zoology. However, for the purposes of this article geology is being excluded and my colleague Don Steward is preparing a paper on our geological holdings for the Geological Curator.

Our collections are being fully documented by collector, subject and provenance as part of the work of the All Midlands Collections Research Unit and the data is being processed and stored on computer at Manchester University. A publication will be produced in due course.

At Stoke small may be considered beautiful or at least manageable and it will be seen that our collections are modest compared to those of similar-sized provincial museums (Hancock & Morgan 1980). Our major holdings are detailed in the papers which appear later in this issue. To date we curate in the region of 4,250 botanical specimens, 3,700 vertebrates and 64,800 invertebrates.

Whilst early collections coming via the North Staffordshire Field Club form the nucleus of our holdings subsequent collecting policy appears to have been based on a 'take what is offered' approach. However, our strength lies in our British holdings and particularly our Staffordshire material. Since 1967 the policy has been to develop the County collections and this will be the sectional approach put forward for inclusion in a written policy presently being worked on by the Museum as a whole.

One new and important source of local knowledge and specimens is the Stoke-on-Trent Environmental Survey; a Manpower Services Commission scheme organized via the natural history section. This survey started in August 1982 has dealt with various aspects of the City's environment but more particularly its geology and biology. A supervisor, three biologists and three geologists have been aided by a clerk/typist and four trainees (at any one time).

### S.O.T.E.S. Personnel

Project Leader	Mr. K. McDade	31/8/1982-present
Secretary	Mrs. S. Harrison	6/9/1982-31/3/1983
Research biologist	Mr. G. C. Slawson	31/8/1982-present
Field biologist	Mr. K. P. Bloor	31/8/1982-present
Field biologist	Mr. H. N. Chadwick	31/8/1982-present

Research geologist	Miss H. Clarke	31/8/1982-present
Field geologist	Miss S. Rayment	31/8/1982-present
Field geologist	Mr. M. J. Branney	13/9/1982-1/5/1983

#### Trainees

Miss K. J. Bentley  
Miss A. D. Furnival  
Mr. S. A. Brayford  
Mr. D. A. Gallagher  
Mr. R. Tunnicliffe

A number of publications will result from this work. The biological aspect of the survey is to continue for a further twelve months during which time we hope to see the accumulated data placed on to computer and the botanical fieldwork completed more thoroughly.

#### Volunteers

During the last few years the section has benefited from the help and devotion of some excellent volunteers. I am grateful to them all but especially to Craig Slawson a competent biologist who worked for one whole year as a volunteer before becoming a member of the S.O.T.E.S. team; to Vivien Nye a graduate biologist and extremely efficient worker who is soon to leave us for the Leicester Museums Studies Course and to Chris Mellenchip a self-employed taxidermist whose skills are put to work for us one day per week.

#### Storage/Display

Details of our storage and display areas have been outlined (Halfpenny and Steward 1982, Stansfield 1981) but as few photographs have been published some are included here. A later paper in this issue describes our gallery aquaria. We are fortunate in having three temporary exhibition galleries in the Museum where we can augment our permanent gallery displays.

#### Extramural activities

Sectional staff are actively involved with local societies particularly the North Staffordshire Field Club and Staffordshire Nature Conservation Trust and maintain close contact with other County organizations such as the West Midland Bird Club, Mid-Staffs Naturalists, South Staffs Naturalists, British Deer Society and the North Staffs group of the Geological Association.

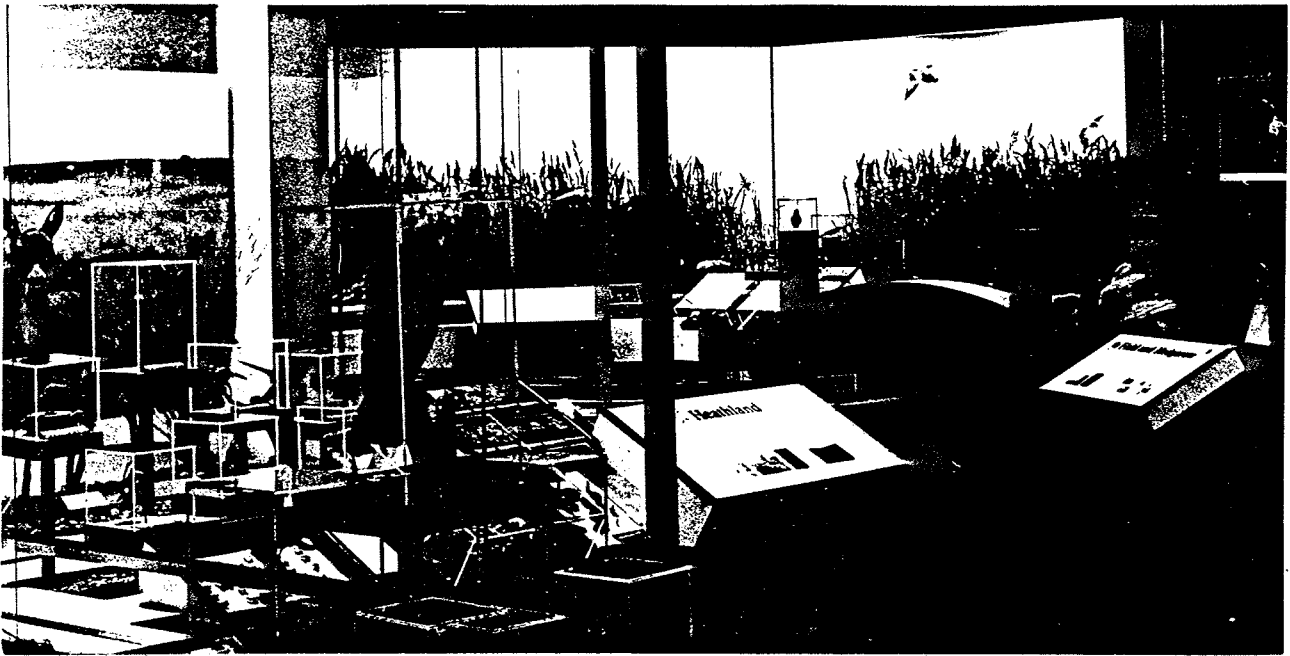
Numerous lectures are undertaken each year.

#### Publications

A number of sectional publications have been produced mainly in connection with the Biological Records Centre. There follows a list of those presently available and those soon to be published.

Single copies are available at the prices quoted. Postage and packing 25p extra.





5. View through the present Natural History gallery.



6. View through the biology store.



7. The laboratory

Botany

(1983) Hayes, C., Checklist of Flowering Plants and Ferns of Staffordshire -  
In preparation

Lepidoptera

(1975) Warren, R.G., Atlas of the Lepidoptera of Staffordshire Part 1  
Butterflies

Reprinting; available 1983/84

(1976) Warren, R.G., Atlas of the Lepidoptera of Staffordshire Part 2 Moths  
Lasiocampidae - Geometridae (Larentiinae)

50p

(1977) Warren, R.G., Atlas of the Lepidoptera of Staffordshire Part 3 Moths  
Geometridae (Larentiinae)

ISBN 0 905080 02 5

55p

(1979) Warren, R.G., Atlas of the Lepidoptera of Staffordshire Part 4 Moths  
Geometridae (Ennominae) - Nolidae

ISBN 0 905080 04 1

85p

(1980) Warren, R.G., Atlas of the Lepidoptera of Staffordshire Part 5 Moths  
Noctuidae (Noctuinae - Cucullinae)

ISBN 0 905080 08 4

£1.25

(1981) Warren, R.G., Atlas of the Lepidoptera of Staffordshire Part 6 Moths  
Noctuidae (Acronictinae - Hypeninae), Hepialidae, Cossidae, Zygaenidae,  
Sesiidae.

ISBN 0 905080 10 6

£1.25

(1983) Warren, R.G., Revised Checklist of Staffordshire Butterflies and Moths  
95p

Diptera

(1979) Rotheray, G.E., Atlas of the Diptera of Staffordshire Part 1  
Hoverflies (Syrphidae)

ISBN 0 905080 05 X

65p

Amphibians and Reptiles

(1978) Halfpenny, G., Atlas of the Reptiles and Amphibians of Staffordshire

ISBN 0 905080 03 3

60p

Birds

(1982) Emley, D. W. & Low, W.J., The Birds of Westport Lake

ISBN 0 905080 14 9

95p

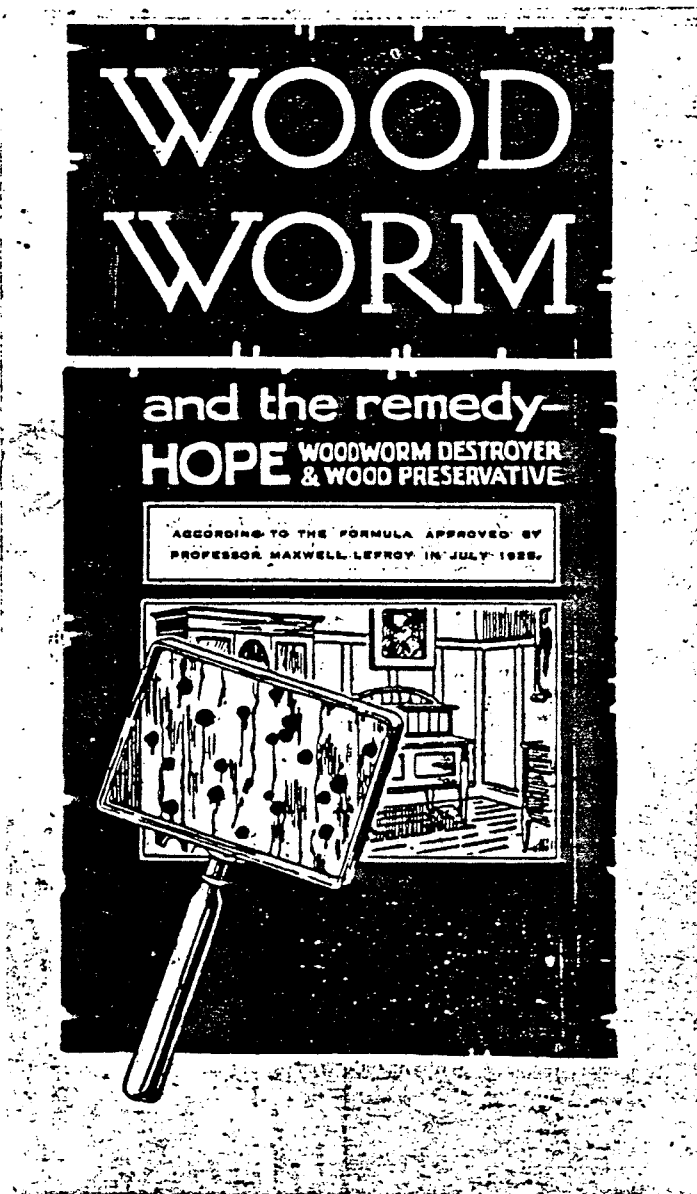
References

- |                 |      |  |
|-----------------|------|--|
| Bemrose, G.J.V. | 1936 | Some notable museums: XVIII<br>The Museums and Art Gallery of Stoke-<br>on-Trent, <u>The North Western Naturalist</u><br>106-109 |
| Bemrose, G.J.V. | 1953 | The "Pitiful" case of City's Tumble-<br>Down Museum<br><u>Sentinel</u> 2nd Feb   |

Bennett, A.	1902	<u>Anna of the Five Towns</u> <u>Chatto and Windus</u>
Black, J.	1971	Abstract from unpublished student project <u>(Manchester University Museums Study Course)</u>
Caddie, A.J.	1905	The Museum in direct connection with the Reference Library <u>Quarterly meeting of Northern Counties Library Association</u>
Caddie, A.J.	1907	The method of collecting and exhibiting English Pottery and Porcelain <u>18th Annual Meeting and Conference of Museums Association in Dundee</u>
Caddie, A.J.	1910	The Board of Education and Provincial Museums <u>Museums Journal X 126-133</u>
City of Stoke-on-Trent	1926	Civic Week Report <u>Libraries Museums and Gymnasium Committee</u>
Greenwood, T.	1888	Museums and Art Galleries <u>Simkin Marshall &amp; Co. London</u>
Halfpenny, G. and Steward, D.I.	1982	Natural History Section - The City Museum and Art Gallery, Stoke-on-Trent <u>Museums Journal 81(4), 216-218</u>
Hancock, E.G. and Morgan, P.J.	1980	A Survey of zoological and botanical material in Museums and other institutions of Great Britain <u>Biological Curators Group Report No. 1, 1-32</u>
Markham, S.F.	1948	Directory of Museums and Art Galleries in the British Isles <u>Museums Association 336-338</u>
Museums Association	1931	Directory of Museums and Art Galleries in the British Isles <u>Museums Association 329-331</u>
N.S.F.C.T.	1904/ 05(a)	Council for 1905-6 <u>North Staffordshire Field Club Transactions XXXIX 5</u>
N.S.F.C.T.	1904/ 05(b)	Coleoptera occurring in North Staffordshire <u>North Staffordshire Field Club Transactions XXXIX, 73-90</u>

N.S.F.C.T.	1906/ 07(a)	Council for 1907-8 <u>North Staffordshire Field Club Transactions XLI, 5</u>
N.S.F.C.T.	1906/ 07(b)	Further additions to the North Staffordshire Coleoptera list <u>North Staffordshire Field Club Transactions XLI, 81-85</u>
N.S.F.C.T.	1908/ 09(a)	Report of Council <u>North Staffordshire Field Club Transactions XLIII, 42-59</u>
N.S.F.C.T.	1908/ 09(b)	Annual Report <u>North Staffordshire Field Club Transactions XLIII, 10</u>
N.S.F.C.T.	1910/ 11	Wildlife around Longton <u>North Staffordshire Field Club Transactions XLV 83-93</u>
N.S.F.C.T.	1924/ 25	Council for 1925-6 <u>North Staffordshire Field Club Transactions LIX, 5</u>
N.S.F.C.T.	1941/ 42(a)	Council for 1942-3 <u>North Staffordshire Field Club Transactions LXXVI, 4</u>
N.S.F.C.T.	1941/ 42(b)	Presidential Address: Birds' Beaks, legs and feet <u>North Staffordshire Field Club Transactions LXXVI, 13-19</u>
N.S.F.C.T.	1958/ 59(a)	Annual Report <u>North Staffordshire Field Club Transactions XCIII, 12</u>
N.S.F.C.T.	1958/ 59(b)	Council for 1959-60 <u>North Staffordshire Field Club Transactions XCIII, 4</u>
N.S.F.C.T.	1959/ 60	Annual Report <u>North Staffordshire Field Club Transactions XCIV, 38</u>
Riley, T.H., Garland, S. and Whiteley, D.	1982	Sheffield City Museums: Natural Sciences section <u>Biology Curators' Group Newsletter 3(2), 71-105</u>
Sentinel	1902	Reference Library and Museum Wanted A.J. Caddie <u>Sentinel 1st Mar</u>

Sentinel	1917	The Birth of an Industry : Lecture to Royal Society of Arts, A.J. Caddie <u>Sentinel</u> 10th Mar
Sentinel	1935	G.J.V. Bemrose - appointed President of the North Western Federation of Museums <u>Sentinel</u> 9th Jan
Sentinel	1955	First sod cut for new Museum premises <u>Sentinel</u> 1st Feb
Sentinel	1956	Opening of New Museum <u>Sentinel</u> 13th Oct
Standing Commission on Museums and Galleries	1963	Survey of Provincial Museums and Galleries <u>H.M.S.O. London</u> , 209
Stansfield, G.	1981	Three new Natural History galleries <u>Museums Journal</u> 81(2), 82-83



Perhaps one should pray too!

Publicity leaflet  
ca. 1927

BOTANY Geoff Halfpenny

In the region of 4,250 specimens, mainly flowering plants and ferns.

3.1 Alga

27 specimens, mainly seaweeds from Falmouth (P. H. Allen) and Charophyta (5) (P. H. Allen, H. P. Reader, P. P. Thornton).

3.3 Myxomycota

3 specimens only collected during the Stoke-on-Trent Environmental Survey.

4. (8, 9, 12, 13, 14) Fungi

M. J. Austin

153 packets of air-dried specimens all from Staffordshire. Mike Austin spent 15 years on the Warwickshire Fungus Survey (Clark 1980), but has Kew check out all rare or new material to him. Mainly Agaricales and a few Aphylllophorales (Hymenomycetes). Very few Pyrenomycetes, Discomycetes and Gasteromycetes.

Dr. D. J. Antrobus

5 packets of air-dried specimens and related 35 mm colour transparencies. Agaricales (Hymenomycetes) from the Kinver area of Staffordshire (1982). I include Dr. Antrobus' collection as I believe we will receive much more material from him.

F. J. Beasley (Formerly Keeper of Natural History, County Museum, Shugborough)

10 air-dried specimens from Staffordshire (Hymenomycetes).

S.O.T.E.S.

120 air-dried specimens collected from within the City. Mainly Agaricales and Aphylllophorales (Hymenomycetes) with some Pyrenomycetes, Discomycetes, Hemibasidiomycetes and Gasteromycetes.

4.18 Lichens

M. A. & G. A. Arnold

26 Staffordshire specimens, all Ascolichenes. The majority have been checked by Dr. D. L. Hawksworth.

H. P. Reader

43 Staffordshire specimens, all Ascolichenes mostly collected by Reader (22) also contains specimens collected by K. Sheldon (3) and P. P. Thornton (18). All of these specimens have been checked and re-determined where necessary by Dr. D. L. Hawksworth.

S.O.T.E.S.

22 specimens from within the City boundary.

### 5.1.1 Bryophyta: Musci

#### P. H. Allen

13 specimens all collected by Allen. Three counties are represented Staffordshire (8), Cambridgeshire (3) and Suffolk (2).

#### M. A. & G. A. Arnold

220 Staffordshire specimens. Some collected by W. M. Baines and R. J. Thomas. Many identified by J. H. Field; some checked by T. Laflin.

#### Reverend E. A. Elliott

Between 1933 and 1941 three collections of mosses totalling 368 specimens were deposited with us. I can now account for only 274. Few were collected by Elliott (20) the majority are British Bryological Society exchanges. There are 36 associated collectors the major ones being W. Bellerby (14), C. H. Binstead (112) and S. P. Rowlands (36). Of the 213 British Isles specimens 161 are from England, mainly Cumbria (VC69, 70) (56), Hereford and Worcester (30) and North Yorkshire (VC62, 64, 65) (30). 29 are from Wales, mainly Gwynedd (VC48, 49) (24); 20 are from Scotland, mainly Strathclyde (Argyll, Mull VC103) (6) and Tayside (Perthshire, VC88) (8). 3 specimens are from N. Ireland.

There are specimens from ten other countries, mainly France (16) and Germany (11).

#### H. P. Reader

207 Staffordshire specimens, mainly collected by Reader (170) also contains specimens collected by J. S. Lather (1), K. Sheldon (1) and P. P. Thornton (35). This collection contains new county records.

#### S.O.T.E.S.

14 specimens from the City.

### 5.1.2 Bryophyta: Hepaticae

#### M. A. & G. A. Arnold

43 Staffordshire specimens some identified by J. H. Field and T. Laflin.

#### H. P. Reader

87 Staffordshire specimens, mainly collected by Reader (74). Others collected by J. S. Lather (1), Rev. D. Murray (2), J. F. Perry (1), Rev. F. Perry (1), K. Sheldon (1) and P. P. Thornton (7).

#### S.O.T.E.S.

5 specimens from the City.

### 5.3.3.2 Lycopside: Lycopodiales

#### J. E. Nowers

2 specimens from North Wales.

E. S. Eedes

1 specimen VC96.

5.3.4.3 Sphenopsida: Equisetales

P. H. Allen

6 specimens, Staffordshire (3), Suffolk (2), Cambridgeshire (1).

E. S. Eedes

1 specimen, Staffordshire, coll. Dr. K. M. Goodway.

J. E. Nowers

2 specimens, Staffordshire.

H. P. Reader

11 Staffordshire specimens, mainly collected by Reader (8), others by Rev. F. K. Clark (1) and W.K. Clark (2).

5.3.5. (4, 5, 6) Pteropsida: Ophioglossales, Osmundales, Filicales

P. H. Allen

14 British specimens, all Filicales, 8 sheets from Staffordshire, 6 other counties represented. Also 3 books of New Zealand ferns (141 sheets).

M. A. & G. A. Arnold

2 Staffordshire specimens, both Filicales.

E. S. Eedes

5 specimens all Filicales from Staffordshire. All but one collected by Eedes, other by Dr. K. M. Goodway.

C. B. Moore

10 specimens. 1 specimen - Osmundales, Staffordshire and 9 specimens of Staffordshire Filicales.

J. E. Nowers

11 specimens. 1 specimen - Ophioglossales, Staffordshire and 10 sheets of British Filicales from Staffordshire (3), Cheshire (1), Derbyshire (1), Devon (1), N. Wales (3), Ireland (1).

H. P. Reader

38 specimens. 2 specimens - Ophioglossales, Staffordshire; 36 Staffordshire Filicales mainly collected by Reader (27), others by Rev. F. K. Clark (1), W. K. Clark (2), E. Reynolds (1) and P. P. Thornton (5).



5.3.7.6 - 5.3.8.77 Spermatophyta: Gymnospermae, Angiospermae

P. H. Allen

547 specimens, 152 from Staffordshire and 342 from other British Counties mainly Cambridgeshire, Norfolk and Suffolk. Majority collected by Allen. Five associated collectors, most important S. Berresford (20). Also contains 53 sheets of French grasses.

E. S. Edees

385 specimens mainly collected by Edees (287). Majority from Staffordshire (312) with twenty other counties represented, only Norfolk exceeding 10 specimens. Contains material from nineteen associated collectors, most important Dr. K. M. Goodway (82).

D. Gee

278 specimens mainly from Staffordshire (177) all collected by Gee between 1956 - 1958. Six other counties represented, mostly Caernarvonshire (32), Cumbria (Westmorland) (37), Hampshire (10) and Yorkshire (20).

B. Jack

191 specimens of tree foliage including many exotic Gymnosperms and various hybrids. A good reference collection but with little locality data.

C. B. Moore

388 specimens all from Staffordshire although the collection includes 13 alien species.

J. E. Nowers

169 specimens including material from Staffordshire (54), Caernarvonshire (17), Tayside (Perthshire) (13), Galway (Ireland) (11) and twenty one other counties.

H. P. Reader

891 specimens all but one from Staffordshire, other from Gloucestershire. Mainly collected by Reader (777) other important collectors - W. K. Clark (11), Rev. D. Murray (10) and P. P. Thornton (62).

D. E. de Vesian

18 Staffordshire specimens

INSECTS Geoff Halfpenny

As in life so in the collections this group exceeds all other collections in terms of numbers. Over 47,000 specimens are curated falling largely into two orders Lepidoptera (almost 23,000) and Coleoptera (almost 24,000).

6.18.6 (1-4) Insecta: Thysanura, Diplura, Protura, Collembola

6.18.6.9 Ephemeroptera

Very few specimens of the above groups. All Staffordshire material collected by local entomologists, museum staff or S.O.T.E.S.

6.18.6.11 Odonata

33 specimens mainly from Staffordshire collected by D. W. Emley and R. G. Warren.

6.18.6 (13, 16, 20, 22, 26, 27, 28, 29, 30, 31, 32) Plecoptera, Orthoptera, Dermaptera, Dictyoptera, Psocoptera, Mallophaga, Anoplura, Hemiptera, Thysanoptera, Neuroptera, Mecoptera

All of the above groups are very poorly represented. Less than 150 specimens in total mainly from Staffordshire.

6.18.6.33 Lepidoptera

M. D. Cox

1,462 specimens mainly from Staffordshire and Cheshire. Also contains H. W. Daltry specimens and Portuguese material collected by J. T. Wattison.

C. Clarke

In the region of 2,200 British specimens.

D. W. Emley

74 Staffordshire specimens.

Dr. R. Freer

About 9,000 specimens in storeboxes. Many without data. Material from Staffordshire and Cornwall (1906 period). Fifteen associated collectors listed from various parts of the British Isles.

J. & W. Hill

About 1,250 specimens over 80% coming from the Leek area of North Staffordshire.

E. Shaw

A collection of about 2,500 specimens, few with data. Eleven associated collectors have been listed accounting for material from nine other counties and France.

Ex. County Museum Shugborough

About 850 British and 142 Foreign specimens few with data (Africa, Persia, New Guinea, Burmah).

Ex. Stafford Museum

About 145 Foreign specimens.

R. G. Warren

510 duplicate specimens from his own collection. Mainly Staffordshire material.

E. V. Whitby

1,723 British specimens mainly from the West Midlands, Staffordshire, Devon and Warwickshire. Six associated collectors listed.

6.18.6.34 Trichoptera

50 Staffordshire specimens mainly collected by R. G. Warren.

6.18.6.35 Diptera

Over 200 specimens mainly Syrphids from Staffordshire collected by D. W. Emley (163), M. Waterhouse (47) and R. G. Warren (3).

6.18.6.36 Siphonaptera

25 specimens.

6.18.6.37 Hymenoptera

About 160 specimens mainly Saw-flies from Staffordshire. Main collector M. Waterhouse (132), R. G. Warren (11), M. D. Cox (12), E. V. Whitby (4).

6.18.6.38 Coleoptera

C. E. Stott

21,172 British specimens, Staffordshire material (mainly Cannock Chase, Chartley and Armitage) dates from 1925 - 1935. Twenty six other counties represented and material from twenty two other collectors, most importantly E. C. Bedwell, J. Collins, H. St. J. Donisthorpe, W. W. Fowler, P. Harwood, E. A. Newbery, W. E. Sharp, J. R. le B. Tomlin and Tyrer.

Most groups except mollusca are poorly represented. Advances have been made in recent years to improve the collections of terrestrial and freshwater invertebrates and a specific storage area has been designated as a spirit store for the housing of future specimens (most of the material is in 1% Phenoxetol solution). Examples of certain groups have been acquired specifically for display and loan purposes. Other specimens, identified for Public Health Departments, have been retained as voucher material.

6.1 Mesozoa - 6.12 Brachiopoda

Very few specimens. Some specimens and photographs of annelids, Platyhelminthes and trout parasites.

6.18 (3, 4) Diplopoda, Chilopoda

Several examples of local millipedes and centipedes.

6.18.7 Crustacea

Less than 30 specimens mainly local woodlice and freshwater crayfish; marine specimens for display.

6.18.8 Arachnida

Over 100 specimens mainly Araneae from Staffordshire. The majority were collected by M. A. & G. A. Arnold and S.O.T.E.S.

6.23 Echinodermata

A few Echinoids and Asteroids for display.

Molluscs

The mollusc collections at the City Museum, Stoke-on-Trent contain approximately 18,500 specimens, the ratio being:-

land and freshwater gastropods	:	freshwater bivalves	:	marine molluscs
85	:	8	:	7

British species practically represent 100% of the collections and Staffordshire material constitutes 40%. The two collections mentioned below make up the bulk of the specimens and are supplemented by material transferred from Shugborough County Museum, Stafford (1978) and by limited collecting over recent years. Molluscan material other than gastropods and bivalves consists of three nautiloid shells.

6.13 MolluscaW. Hill

2,830 land and freshwater Gastropods and 625 freshwater Bivalves mainly from north Staffordshire.

J. R. B. Masefield

About 13,000 land and freshwater Gastropods and 700 freshwater Bivalves of British origin, about 25% from Staffordshire.

J. R. B. M. was a great swapper of specimens and there are at least 40 associated collectors mentioned, the main ones being:-

Lionel E. Adams, 77 St. Giles Street, Northampton (circa 1894)  
Charles Oldham, Essex House, Walford (circa 1909)  
Robert Cairns, 159 Queen Street, Hurst, Ashton-under-Lyne (circa 1910)  
Fred Taylor, 38 Landseer Street, Oldham (circa 1900)  
H. C. Huggins, Syndale House, Park Road, Sittingbourne (circa 1916)

#### S.O.T.E.S.

19 specimens from the City.

#### FISH Don Steward

The fish collection is small and consists entirely of mounted specimens. As these are mainly trophy specimens from Staffordshire waters they are not particularly representative of the local species. The bulk of the collection was presented by the Stoke City and District Anglers' Association in 1975. The specimens are suitable for display and have been used for loans. One of the reasons for including an aquarium in the display area (see elsewhere in this issue) was to overcome this lack of typical sized fish.

#### 6.25.3.4 Chordata: Vertebrata: Osteichthyes

Less than 30 specimens, all mounted. Many from Staffordshire waters.

#### AMPHIBIANS, REPTILES Geoff Halfpenny

##### 6.25.5 Amphibia

Only 14 specimens mainly freeze-dried for display. Few spirit specimens of Staffordshire material.

##### 6.25.6 Reptilia

Only 13 specimens including freeze-dried, spirit, model and sloughed-skin material. Few with data. Includes the black grass snake from Staffordshire, (Halfpenny, G. and Bellairs, A. D'A. 1976).

#### BIRDS Geoff Halfpenny

Including specimens in deep freeze awaiting treatment the collection numbers 1,640 specimens of which 523 are study skins, and 1,067 are mounted specimens. The material is mainly of British and European species although some exotica is present.

### 6.25.3.7 Aves

#### Dr. P. B. Mason

634 mounted specimens of mainly British species with a few exotics including a Passenger Pigeon. The work of famous taxidermists includes that of James Varley and John Hancock (Herriott 1968). This collection came to us in November, 1981 on an initial 10 year loan following the closure of the Burton-upon-Trent Museum. A catalogue was produced (Wain 1963).

#### Dr. R. H. Read

295 study skins, mainly British (183) especially Norfolk (108), Orkney (17) and Staffordshire (10). Also includes 18 Foreign specimens, mainly U.S.S.R. (8). A number (68) lack data and some (26) are 'query' localities.

#### General Collection

The remaining material has been acquired over the years from a number of sources. Mounted specimens are purchased to improve our British material and to fill gaps and all Staffordshire specimens coming in as road casualties etc. are produced as study skins (Stansfield 1965).

#### EGGS      Don Steward

The collection contains just over 1,650 eggs representing 262 British species. Most of the individual collections were obtained from local private collectors unfortunately interested more in the eggs as objects rather than as biological records; this means that the collection has very little in the way of locality and clutch data to augment the specimens. Less than 1% of the material is Foreign and although the collection as a whole is useful for comparison purposes it is of little academic value. There are also 35 nests, some of which contain clutches of eggs. All of the eggs have been catalogued in readiness for possible Department of the Environment registration.

#### MAMMALS      Geoff Halfpenny

### 6.25.3.8 Mammalia

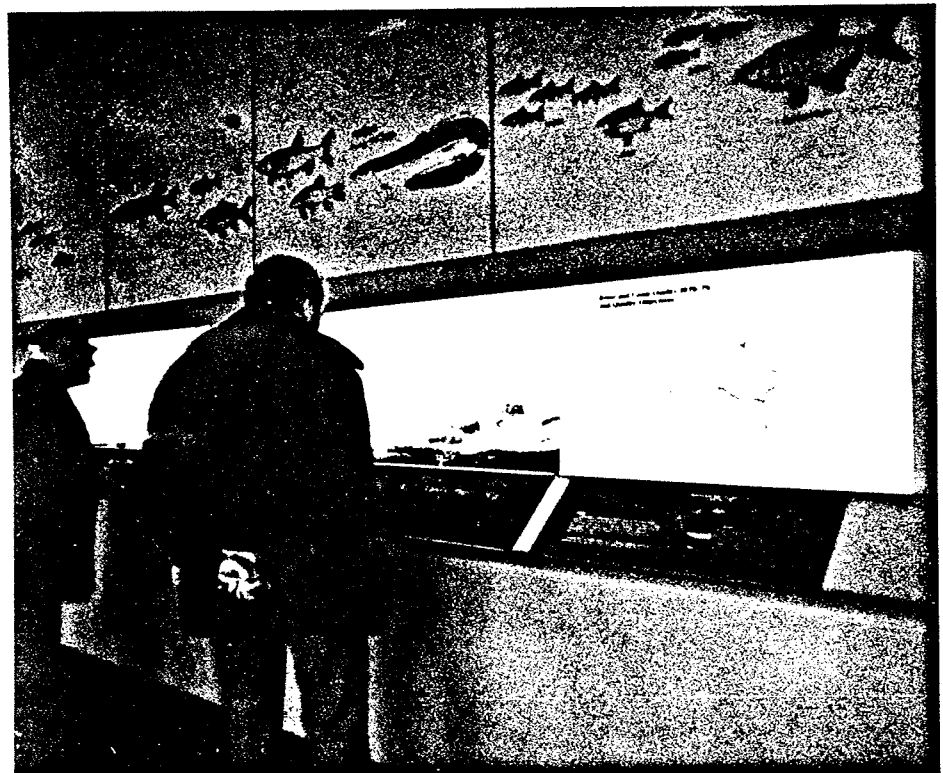
This is a general collection having been accumulated over the years with no single major donor. Including specimens in deep freeze, the collection numbers 323 specimens of which 75 are study skins, 131 are mounted specimens and 27 (mainly Chiroptera) are spirit specimens. Almost all the material is of British species.

The collections of bone material are not very extensive and consist of approximately 35 skulls of common British mammals, a variety of miscellaneous limb, rib and spinal bones and a small collection of antlers and game-heads. Mammal specimens stored as study skins have their skulls stored with them. Archaeological bone material is also housed in the biology store and includes over 100 items from an assortment of species. The bone material we do possess, particularly the skulls, has been found to be very useful for schools, who wish to compare the dentition of various animals.

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Herriott, S. (Ed.)	1968	British Taxidermists A historical directory <u>Leics Museums</u>
Stansfield, G.	1965	Bird skin collections and local museums <u>Bird Study Vol. 12, 129-132</u>
Wain, H.J.	1963	The Mason Collection of Birds <u>Museum &amp; Art Gallery, Burton-upon-Trent</u>

8. The aquaria



In the permanent display gallery (opened February 1981), the section devoted to aquatic habitats is augmented by two large aquarium tanks exhibiting local freshwater species. The inclusion of these tanks was agreed as it was considered that it would be the most interesting way of displaying fish and other aquatic flora and fauna, as well as providing a 'live' exhibit which seem so popular with children. Reservations to these arguments were the consideration of the time involved in maintenance and the problems that arise if and when disease strikes. The final decision to include the aquaria has however proved to be beneficial with regard to public appreciation.

The two tanks are situated alongside each other and have a mid-line viewing height of approx. 1300 mm; the labels are arranged on sloping boards at the base of the tanks and silk-screened fish outlines are situated above the tanks. Direct contact with the tanks is prevented from the gallery by two large sheets of glass. The option to use two large tanks rather than several smaller tanks was taken so that larger fish could be accommodated more comfortably.

### The Negative Aspects

Problems have arisen from time to time and are mainly due to disease and suspension accumulation. Initially filtration relied solely on the under-gravel system, but this proved to be inadequate and was supplemented by external circulatory filters. The original fish stock was acquired from the Severn Trent Water Authority but overstocking, unsuitable species and disease quickly reduced the population. At this stage the tanks had to be cleaned out and disinfected, and the surviving fish (Crucian Carp, Leather Carp and Perch) were used as the nucleus of a renewed display.

Plants have continued to cause concern; the original idea was to have aquatic flora to help in species identification, to provide extra oxygen, and to give a pleasant visual effect. However a combination of fish eating the plants and possibly an inadequate light source has resulted in very limited growing success.

### Maintenance and Feeding

The time taken to look after the aquaria is about 5 hrs/week. The work involved includes cleaning algae off the inside of the glass, siphoning off solid waste products, water changing, cleaning of the circulatory filters and feeding. The fish are fed 5 days a week and, from the excitement in the tanks, appear to understand that the presence of a white lab coat in the morning denotes that food is at hand. The diet is of floating pond pellets supplemented by maggots, and occasionally earthworms. The amount of food given is not accurately gauged and depends on the generosity of the feeder. About 20-30 pellets daily are given to the occupants of the 'big' fish tank, and about 5 to the others. The fish at the moment seem healthy enough on the food given and the amount of uneaten residue is minimal.

Preparatory chemicals from the local pet shop are used when necessary to combat white spot and fin rot, and to purify the tap water. Large pebbles from the local Triassic conglomerates have been found to be ideal for providing visual features in the tanks as they are easily cleaned and are chemically inert quartzites.

The working area behind the aquaria is entered via a concealed doorway off the



gallery. It contains a sink unit with hot and cold mains water supply, a smaller 'hospital' tank, and the electrical supplies.

The Successful Aspects

Tank 1

- 2 Leather Carp (approx 280 mm long)
- 4 Tench (200 mm)
- 1 Perch (150 mm)
- Assorted plastic plants

The Leather Carp are the stars being the biggest and most active fish, they have also grown considerably in the two years they have been resident. The Tench were originally very shy, but now have acclimatised to the tank. The Perch, a replacement of the original stock, is too small to attack the other fish.

Tank 2

- 2 Crucian Carp (160 mm)
- 2 Bitterling (1 male, 1 female 60 mm)
- 1 Bream (120 mm)
- 3 Bullheads (80 mm)
- several adult Sticklebacks
- 1 Ramshorn Snail
- sprigs of Canadian Pondweed

The Bitterlings are included as they have established themselves at Hanley Park Lake and are particularly common at this local site (Lever 1977). The Bullheads and Sticklebacks exhibit territorial behaviour which becomes more aggressive when the tadpole barrier partitions off part of the tank.

Each year so far the emergence of tadpoles has been successfully exhibited. This is catered for by simply inserting a sheet of thin perspex which sections off part of the tank and prevents any contact between the predatory fish and the tadpoles. A high success rate in frog development has been observed and the maturing frogs are released at the site of spawn collection. A useful aside to this display is the voracious appetite of the tadpoles. Several small mammal skulls, that have had as much flesh as possible removed by hand, have been dropped into the reserve tank. The tadpoles then delicately, but energetically, proceed to remove the remaining flesh and leave surprisingly clean skulls suitable for inclusion into the osteological collection.

Other species that have been exhibited with varying degrees of success are Gudgeon, Trout, Rudd, Ruff, Roach, Dace, assorted snails, Caddis larvae, Great Diving Beetle and freshwater Crayfish. The Ruff was doing well until it was partially swallowed by one of the Leather Carp and had to be extracted using tweasers. The Crayfish probably died from the lack of suitable food. All but the largest snail tend to be eaten.

Tank Data

	Each Display Tank	Reserve Tank
Dimensions	1800 mm x 460 mm x 615 mm	1300 mm x 310 mm x 375 mm
Capacity	500 litres	150 litres
Lighting	4 ft. 40 Watt Deluxe Warm White fluorescent tube	2 ft. 40 Watt Grolox fluorescent tube
Lighting Control	time switch (on from 8.30 a.m. to 8.10 p.m. )	manual



and was an active entomologist mainly collecting Lepidoptera though other groups are represented. He was Chairman of the Entomology section of the Burton-on-Trent Natural History and Archaeological Society in the 1940's. His collection came to us in 1966.

M. D. Cox

Mr. Malcolm Cox is an Optician who presently lives in Alsager just over the Staffordshire border into Cheshire. He appears to have balanced a fondness for collecting Lepidoptera and a fondness for collecting geological specimens until in 1979 shortage of space together with the wish that his specimens were safeguarded led to him presenting his lepidoptera collection to us. The collection contains not only his own material but that collected by his uncle the late J. T. Wattison (1888-1974) who worked on lepidoptera in Portugal for some time (Wattison 1928) and the late H. W. Daltry F.R.E.S. Chairman of the Entomology section of the North Staffordshire Field Club from 1927-1950.

E. S. Edees (1907-)

Mr. Eric Edees of Newcastle-under-Lyme is Staffordshire's leading authority on plants and author of the most recent County flora (Edees 1972). His main interest today is the study of brambles, of which he possesses a large collection. His general herbarium was presented to the Department of Biological Sciences at Keele University and we have been able to extract duplicate material for our needs. Mr. Edees has been Chairman of the Botany section of the North Staffordshire Field Club from 1943 to the present (NSFCT 1942/43).

Rev. E. A. Elliott

Reverend Elliott became a member of the North Staffordshire Field Club in 1925 and its President in 1935 (NSFCT 1933/34). In 1936 he moved to live at South Stoke, Reading. For a time he was the President of the British Fuchsia Society and Editor of its Journal and for many years Secretary and Editor of the Pteridological (Fern) Society which awarded him its Stansfield Medal.

For a long time he was engaged on the classification of rare plants in S. Oxfordshire (NSFCT 1959/60(a)).

Whilst in Staffordshire he resided at Dunstall Vicarage, Burton-on-Trent.

D. W. Emley (1952-)

Mr. David Emley of Trent Vale, Stoke-on-Trent is a keen naturalist with particular interests in entomology, ornithology, photography and sound recording. He is presently Chairman of the Staffordshire Branch of the West Midland Bird Club and has been Chairman of the Zoology Section of the North Staffordshire Field Club since 1979 (NSFCT 1979/80). He is author of several publications (Emley 1980, 1982, Emley & Low 1982).

Dr. R. Freer

I wish I knew more about Dr. Freer who lived at Rugeley in Staffordshire from the 1880's to 1920? He is noted for recording the Small Lappet: Phyllodesma ilicifolia (L.) on Cannock Chase, Staffordshire on 17th May 1896 (VCH 1908). I have seen the specimen in the Birmingham City Museum and Art Gallery.

D. Gee

Mr. Derek Gee was a student at King Edward VI School Stafford before taking an Honours Degree in Agriculture at Leeds University. He was last heard of working in Winsconsin, U.S.A. His herbarium which came to us via the County Museum Shugborough in 1978 was formed between 1956-1958.

J. & W. Hill

Messrs. John (1872-1959) and William Hill (1876-1954) were brothers living in Leek, Staffordshire. They worked in their father's printing and stationery business in Stanley Street, Leek and eventually became partners. Their entomological partnership led to the formation of a very important local Lepidoptera collection. Numbers under the specimens tally with dated entries in a diary. They not only collected the insects but also made their own entomological cabinet (in which the specimens are still housed) in 1896/97. The collection dates from 1897-1946 and came to us in 1960 (NSFCT 1959/60(b), NSJFS 1961).

W. Hill

William Hill (see above entry) seemingly spread his net wider than the Lepidoptera (if you will excuse the pun) and took to collecting molluscs. His collection came to us via Buxton Museum in April 1981 having agreed with Mike Bishop, Curator of Buxton Museum and Derbyshire Museums Service that it had more relevance to Staffordshire. The original donor, Miss Doris Hill, daughter of William was also contacted and readily agreed to the transfer.

B. Jack (1912-)

Mr. Bernard Jack presently living in Rugeley, Staffordshire amassed a collection of tree foliage whilst studying tree species in the British Isles. His first collection was deposited at Sandon Hall in Staffordshire, following the production of a booklet (Jack 1971). We were presented with his second collection in 1982.

J. R. B. Masefield (1850-1932)

Although born at Stone, Staffordshire John Richard Beech Masefield lived most of his life at Rosehill, Cheadle, Staffs. The son of a doctor, he was educated at Cheltenham College and Jesus College, Cambridge and after gaining an M.A. was articled to the firm of solicitors, Messrs. Blagg and Son.

Shortly before his death his mollusc collection and some archaeological material was purchased by Stoke-on-Trent Corporation for £25. Masefield was an active member of the North Staffordshire Field Club (NSFCT 1931/32).

Dr. P. B. Mason

Dr. Mason lived at Trent House, Burton-upon-Trent, Staffordshire where he built up a small natural history museum. His mounted bird collection was purchased by the Burton-upon-Trent Corporation from the Executors in 1981. The basis of the collection was 296 cases of birds purchased from James Varley who had personally collected and mounted many of the specimens and many purchased mounted from John Hancock of Newcastle-on-Tyne (Herriott 1968). An article on the collection was written by Storer (1924), a catalogue was produced (Wain 1963) and a guide to those on display written (Cheese 1975). For Locations of other Mason material see Hancock and Pettitt (1981).

C. B. Moore (1870-1944)

Mr. Clifford Moore formed a collection of plants from the Stafford area around 1889/90. Formerly held by the Mid Staffordshire Field Club before being donated to the County Museum Shugborough (1969) and subsequently passing to us in 1978. The plants are pressed in book volumes, 12 in all, Vols. 3 and 6 missing.

Contains the earliest Staffordshire specimen of Indian Balsam: Impatiens glandulifera Royle (Coll. 1889) antedating what was considered to be the earliest record by 34 years (Edees 1965).

J. E. Nowers

Nowers must have been one of the first members of the Burton-on-Trent Natural History and Archaeological Society as he joined it as a boy in 1876/7. He won first prize for a collection of flowers and went on to become Hon. Sec. of the Botanical Section. He had a great deal to do with the Flora of Burton & District published in the Transactions of the Society in about 1880. Nowers later went to live in Darlington where he died. His main herbarium is at Sunderland Museum. Of particular interest are the saltmarsh specimens from the Branston area on which he wrote (Nowers and Wells 1890). We received the Staffordshire material from the Burton-on-Trent Natural History and Archaeological Society in 1982.

Dr. R. H. Read

Very little is known about Dr. Read whose bird skin collection came to us in 1936. He was twice Vice President of the North Staffordshire Field Club in 1903 and in 1905 (NSFCT 1902/03, 1904/05) and lectured locally on bird topics (Sentinel 1933).

Rev. H. P. Reader (1850-1929)

Reverend Henry Peter Reader was "stated to be 'formerly of Leicester' by Mott et al (1886) and Horwood (1904) indicates that he went to reside in another county in 1898. He apparently lived at Holy Cross Priory Leicester at one time (Mott et al, 1886; Horwood 1907(a)). Reader's main Lichen herbarium is now at the University of Bristol (BRIST) but other Lichen material is in LSR" [Leicester City Museum], (Hawksworth 1974).

The other county mentioned by Horwood (1904) would have been Staffordshire as a few specimens of Lichens, mosses and Liverworts date to early 1899. The bulk of the specimens were however collected in the 1920's. Father Reader lived at the Dominican Priory in Rugeley Staffordshire and his herbarium was added to the permanent collection of the North Staffordshire Field Club in Hanley Museum in 1927. Locations of other Reader material listed by Hancock and Pettitt (1981). Reader contributed to the North Staffordshire Field Club Transactions and a particularly important article refers to the Flora of Hawkesyard (NSFCT 1922/23 and 1925/26).

E. Shaw

Mr. Edwin Shaw was a local man about whom I have little information. Indeed it was not until his grandson called into the Museum in 1981 that I was able to put his name to a collection of Lepidoptera. I hope to have more information shortly.

1. data in square brackets mine.

C. E. Stott (1868-1935)

Mr. Stott worked for the Lancashire and Yorkshire railway before being promoted and finally becoming head of continental travel. He was at various times resident at Swinton, Worsley, Reigate and following his retirement in 1927, Staffordshire. He was said to have been an entomologist from boyhood and for many years specialised in Coleoptera (NSFCT 1935/36).

He is noted for his rediscovery on Chartley Moss N.N.R. Staffs of Cryptocephalus decemmaculatus (L.) a very rare phytophagous beetle after an interval of nearly 60 years (Stott 1929).

Unfortunately for Mr. Stott, people's attempts to honour him by naming a new species after him came to no avail as the wyles of taxonomy now rank the species concerned as synonyms. One such insect was a Capsid bug: Dicyphus stotti China, 1930 (NSFCT 1930/31) which now falls under Dicyphus pallicornis (Meyer-Dür, in Fieber, 1861); and another was a Clavicorn beetle: Stenichnus stotti Donisthorpe, 1932.

The Type and one Co-Type of this insect are in the BM(NH) (Personal communication with M. J. D. Brendell) and there are six specimens labelled Co-Type in our collection.

This species now falls with the synonymy of Stenichnus pusillus (Müll & Kunze, 1822). For further references see Donisthorpe (1932), Besuchet (1958) and MacKechnie-Jarvis (1966).

D. E. de Vesian

Miss de Vesian was one time county botanical recorder for Gloucestershire and her main herbarium is housed at the City Museum and Art Gallery there (Acc. No. 6/1973). She requested that material from other counties be offered to museums in the area where it was collected and it was in this way that 18 specimens came to us in 1974 (Personal communication with Mr. D. L. Dartnall, Deputy Curator/Keeper of Natural History).

R. G. Warren (1912-)

Mr. Richard Warren is Staffordshire's leading authority on Lepidoptera and a good naturalist in all the meanings of that word. He took over from H. W. Daltry as Chairman of the Entomology section of the North Staffordshire Field Club in 1951 and holds this position to date. He has authored several publications on lepidoptera via the Staffordshire Biological Recording Scheme (see publications list). He maintains a private collection of Lepidoptera, Trichoptera, Neuroptera and Odonata and to date has presented us with almost 600 specimens.

M. W. Waterhouse

Maurice Waterhouse is warden of the R.S.P.B. Reserve at Coombes Valley near Leek in Staffordshire and is a naturalist and conservationist with wide tastes. He is presently Vice-Chairman of the Staffordshire Nature Conservation Trust. He is an authority on Coleoptera and has greatly aided the study of this group in Staffordshire. He also studies Saw-flies and the majority of specimens which he has donated belong to this group. To date he has presented almost 200 specimens.

Colonel E. V. Whitby (c.1885-)

Colonel Whitby a medical officer who retired early took to forming a Lepidoptera collection in 1948/49. When I met him in 1978 at his house in Sutton Coldfield he was in his early 90's and unfortunately suffering from failing eyesight. He would however reminisce fervently about his entomological exploits once I mentioned a certain insect. His beautifully mounted specimens came to us in a magnificent mahogany cabinet.

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Natural History Classification Scheme in use at the City Museum and Art Gallery, Stoke-on-Trent Geoff Halfpenny

I often feel that as a small profession we fail at times to communicate our activities to our colleagues and in so doing necessitate fellow curators having continually to reinvent the wheel.

The classification scheme as detailed enables us to store information (specimen and field records (BRC)) and material in a way which suits our particular needs and is included here in the hope that it may be of use to natural history sections in other institutions.

I must acknowledge the tremendous amount of work put into this scheme by G. Craig Slawson presently employed on a Manpower Services Commission project at the Museum, and Mr. Chris J. Cleal of the Nature Conservancy Council's Geological Conservation Review Unit but take full responsibility for any nomenclatural errors.

I omitted a source of reference for Lichens

(4.18+19) which is:  
Ahmadjian V., and Hale, M.E. (Eds.) 1973  
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9. The Mason bird collection as displayed at Burton in 1972.

EMPIRE NATURAE (LIVING ORGANISMS)

Sub-Empire : Prokaryota

- (1) Kingdom : Monera (Bacteria and Blue Green Algae)
- (2) Kingdom : Vira (Viruses)

Sub-Empire : Eukaryota

- (3) Kingdom : Protista (True algae, Protozoa and slime moulds)
  - (1) Alga.
  - (2) Protozoa.
  - (3) Myxomycota.
- (4) Kingdom : Fungi (True Fungi)
- (5) Kingdom : Plantae (Higher plants)
  - (1) Bryophyta (1. Musci, 2. Hepaticae).
  - (2) Nematophyta (extinct).
  - (3) Tracheophyta (1. Rhyniopsida, 2. Psilotopsida, 3. Lycopsidea, 4. Sphenopsida, 5. Pteropsida, 6. Progymnospermopsida, 7. Gymnospermae, 8. Angiospermae.)
- (6) Kingdom : Animalia (Animals)
  - 23 Phyla (Mesozoa ——— Chordata).

Sub-Empire : Prokaryota

- (1) Kingdom : Monera (Bacteria and Blue Green Algae)

Classes

- (1) Schizomycetes (true bacteria).
- (2) Spiromycetes (spirochaetes).
- (3) Rickettsiomycetes (rickettsias).
- (4) Cyanophyceae (blue green algae).

- (2) Kingdom : Vira (Viruses)

Classes

- (1) Deoxyhelica (Helical DNA Viruses).
- (2) Deoxycubica (Polyhedral DNA Viruses).
- (3) Deoxybinala (T-even Bacteriophages).
- (4) Ribohelica (Helical RNA Viruses).
- (5) Ribocubica (Polyhedral RNA Viruses).

Viruses from Fundamentals of Microbiology M. Frobisher 8th Edition 1968.

Sub-Empire : Eukaryota

(3) Kingdom : Protista (True algae, Protozoa and slime moulds).

(1) Alga (True Algae)

Divisions

- (1) Chromophyta.
- (2) Rhodophyta.
- (3) Chlorophyta.
- (4) Charophyta.

(See - Phycology - R. E. Lee (1980).

(2) Protozoa

Classes

- (1) Mastigophora.
- (2) Sarcodina.
- (3) Actinopoda.
- (4) Sporozoa.
- (5) Cnidosporidea.
- (6) Ciliata.

(See - Larouse Encyclopedia of Animal Life).

(Sarcodina replaces Rhizopoda - see Principles of Invertebrate Palaeontology Shrock and Twenhofel (1953)).

(3) Myxomycota (slime moulds)

Classes

- (1) Acrasiomycetes.
- (2) Hydromyxomycetes.
- (3) Myxomycetes.
- (4) Plasmodiophoromycetes.

(See - Introduction to Fungi : John Webster : 1527.L.1981).

Sub-Empire : Eukaryota

(4) Kingdom : Fungi (True Fungi)

Classes

- (1) Chytridiomycetes.
- (2) Hyphochytridiomycetes.
- (3) Oomycetes.
- (4) Zygomycetes.
- (5) Trichomycetes.
- (6) Hemiascomycetes.
- (7) Plectomycetes.

Classes

- (8) Pyrenomycetes.
- (9) Discomycetes.
- (10) Laboulbeniomyces.
- (11) Loculoascomycetes.
- (12) Hemibasidiomycetes.
- (13) Hymenomycetes.
- (14) Gasteromycetes.
- (15) Coelomycetes.
- (16) Hyphomycetes.
- (17) Agonomycetes.

(See - Introduction to Fungi : John Webster : 1527.L.1981).

- (18) Ascolichenes )
- (19) Basidiolichenes ) Lichens
- (20) Deuterolichenes n.n.)

(Lichens classified according to G. Craig Slawson, 1981).

n.n. = Nomen Novum

Sub-Empire : Eukaryota

- (5) Kingdom : Plantae (Higher Plants)

Division

- (1) Bryophyta (Mosses and Liverworts)

Class

- (1) Musci (Mosses)

Orders

- (1) Sphagnales.
- (2) Andreaeales.
- (3) Polytrichales.
- (4) Buxbaumiales.
- (5) Fissidentales.
- (6) Dicranales.
- (7) Pottiales.
- (8) Grimmiiales.
- (9) Funariales.
- (10) Schistostegales.
- (11) Tetrarhiales.
- (12) Eubryales.
- (13) Isobryales.
- (14) Hookeriales.
- (15) Hypnobryales.

Class

- (2) Hepaticae (Liverworts)

Orders

- (1) Anthocerotales.
- (2) Sphaerocarpaceales.
- (3) Marchantiales.
- (4) Metzgeriales.
- (5) Calobryales.
- (6) Jungermanniales.

(See - British Mosses and Liverworts : E. V. Watson : 1127.L.1979).

Sub-Empire : Eukaryota

- (5) Kingdom : Plantae (Higher Plants)

Division

- (2) Nematophyta - (extinct group (Prototaxites, Nematothallus) of uncertain position).
- (3) Tracheophyta (Vascular Plants)

Classes

- (1) Rhyniopsida (Psilopsida)

Orders

- (1) Rhyniales - extinct.
- (2) Zosterophyllales - extinct.
- (3) Trimerophytales - extinct.

- (2) Psilotopsida

- (1) Psilotales

- (3) Lycopsidea

Orders

- (1) Protolpidodendrales - extinct.
- (2) Lycopodiales.
- (3) Lepidodendrales - extinct.
- (4) Isoetales.
- (5) Selaginellales.
- (6) Pleuromeiales - extinct.

- (4) Sphenopsida

Orders

- (1) Sphenophyllales - extinct.
- (2) Calamitales - extinct.
- (3) Equisetales.

(5) Pteropsida

Orders

- (1) Cladoxylales - extinct.
- (2) Coenopteridales - extinct.
- (3) Marattiales.
- (4) Ophioglossales.
- (5) Osmundales.
- (6) Filicales.
- (7) Marsileales.
- (8) Salviniiales.

(6) Progymnospermopsida

- (1) Aneurophytales - extinct.
- (2) Protospityales - extinct.
- (3) Archaeopteridales - extinct.

(Adapted from The Morphology of Pteridophytes K. R. Sporne (1962) Hutchinson by communication with C. J. Cleal.)

(7) Gymnospermae

Orders

- (1) Pteridospermales - extinct.
- (2) Bennettitales - extinct.
- (3) Pentoxylales - extinct.
- (4) Cycadales.
- (5) Cordaitales - extinct.
- (6) Coniferales.
- (7) Taxales.
- (8) Ginkgoales.
- (9) Gnetales.

(From The Morphology of Gymnosperms K. R. Sporne (1965) Hutchinson Univ. Lib. 2nd Edition 1974.)

(8) Angiospermae

Orders

- (1) Magnoliales.
- (2) Illiciales.
- (3) Laurales.
- (4) Piperales.
- (5) Aristolochiales. \*
- (6) Nymphaeales. \*
- (7) Ranunculales. \*
- (8) Papaverales. \*
- (9) Sarraceniales. \*
- (10) Trochodendrales. \*
- (11) Hamamelidales. \*
- (12) Eucommiales.
- (13) Leitneriales.
- (14) Myricales. \*
- (15) Fagales. \*
- (16) Casuarinales. \*
- (17) Caryophyllales. \*
- (18) Batales.
- (19) Polygonales. \*
- (20) Plumbaginales. \*

- (21) Dilleniales. \*
- (22) Theales. \*
- (23) Malvales. \*
- (24) Urticales. \*
- (25) Lecythidales.
- (26) Violales. \*
- (27) Salicales. \*
- (28) Capparales. \*
- (29) Ericales. \*
- (30) Diapensiales. \*
- (31) Ebenales.
- (32) Primulales. \*
- (33) Rosales. \*
- (34) Fabales. \*
- (35) Podostemales.
- (36) Haloragales. \*
- (37) Myrtales. \*
- (38) Cornales. \*
- (39) Proteales. \*
- (40) Santalales. \*
- (41) Rafflesiales.
- (42) Celastrales. \*
- (43) Euphorbiales. \*
- (44) Rhamnales. \*
- (45) Sapindales. \*
- (46) Juglandales. \*
- (47) Geraniales. \*
- (48) Polygalales. \*
- (49) Umbellales. \*
- (50) Gentiales. \*
- (51) Polemoniales. \*
- (52) Lamiales. \*
- (53) Plantaginales. \*
- (54) Scrophulariales. \*
- (55) Campanulales. \*
- (56) Rubiales. \*
- (57) Dipsacales. \*
- (58) Asterales. \*
- (59) Alismatales. \*
- (60) Hydrocharitales. \*
- (61) Najadales. \*
- (62) Triuridales.
- (63) Commelinales.
- (64) Eriocaulales. \*
- (65) Restionales.
- (66) Poales. \*
- (67) Juncales. \*
- (68) Cyperales. \*
- (69) Typhales. \*
- (70) Bromeliales.
- (71) Zingiberales.
- (72) Arecales.
- (73) Cyclanthales.
- (74) Pandanales.
- (75) Arales. \*
- (76) Liliales. \*
- (77) Orchidales. \*

\* = Represented in British Flora.

Angiosperms listed according to V. H. Heywood (1978)  
Flowering Plants of the World.



Sub-Empire : Eukaryota

(6) Kingdom : Animalia (Animals)

(1) Phylum Mesozoa

- (1) Order Dicyemida.
- (2) Order Orthonectida.

(2) Phylum Parazoa (Porifera)

- (1) Class Calcarea.
- (2) Class Hexactinellida.
- (3) Class Demospongia.
- (4) Class Pleospongia - extinct.

(3) Phylum Cnidaria (Coelenterata)

- (1) Class Prolomedusae - extinct.
- (2) Class Dipleurozoa - extinct.
- (3) Class Hydrozoa.
- (4) Class Stomatoporoidea - extinct.
- (5) Class Scyphozoa.
- (6) Class Anthozoa.

(4) Phylum Ctenophora

- (1) Class Tentaculata.
- (2) Class Nuda.

(5) Phylum Platyhelminthes

- (1) Class Turbellaria.
- (2) Class Trematoda.
- (3) Class Cestoda.

(6) Phylum Nemertina

- (1) Class Anopla.
- (2) Class Enopla.

(7) Phylum Aschelminthes

- (1) Class Nematoda.
- (2) Class Rotifera.
- (3) Class Gastrotricha.
- (4) Class Kinorhyncha.
- (5) Class Nematomorpha.

(8) Phylum Acanthocephala

(9) Phylum Entoprocta

- (10) Phylum Bryozoa (Polyzoa)
  - (1) Class Phylactolaemata.
  - (2) Class Stenolaemata.
  - (3) Class Gymnolaemata.
- (11) Phylum Phoronida
- (12) Phylum Brachiopoda
  - (1) Class Inarticulata.
  - (2) Class Articulata.
- (13) Phylum Mollusca
  - (1) Class Monoplacophora.
  - (2) Class Amphineura.
  - (3) Class Gastropoda.
  - (4) Class Scaphopoda.
  - (5) Class Bivalvia.
  - (6) Class Cephalopoda.
- (14) Phylum Priapulioidea
- (15) Phylum Sipunculoidea
- (16) Phylum Echiuroidea
- (17) Phylum Annelida
  - (1) Class Archiannelida.
  - (2) Class Polychaeta.
  - (3) Class Oligochaeta.
  - (4) Class Hirudinea.
- (18) Phylum Arthropoda
  - (1) Class Onychophora.
  - (2) Class Pauropoda.
  - (3) Class Diplopoda.
  - (4) Class Chilopoda.
  - (5) Class Symphyla.
  - (6) Class Insecta.
    - (Apterygota)
      - (1) Order Thysanura.
      - (2) Order Diplura.
      - (3) Order Protura.
      - (4) Order Collembola.
    - (Exopterygota)
      - (5) Order Palaeodictyoptera - extinct.
      - (6) Order Megasecoptera - extinct.
      - (7) Order Protohemiptera - extinct.
      - (8) Order Protephemerida - extinct.
      - (9) Order Ephemeroptera.
      - (10) Order Protodonata - extinct.

- (11) Order Odonata
- (12) Order Protopelaria - extinct.
- (13) Order Plecoptera.
- (14) Order Grylloblattodea.
- (15) Order Protorthoptera - extinct.
- (16) Order Orthoptera.
- (17) Order Caloneurodea - extinct.
- (18) Order Glosselytrodea - extinct.
- (19) Order Phasmida.
- (20) Order Dermaptera.
- (21) Order Embioptera.
- (22) Order Dictyoptera.
- (23) Order Protelytroptera - extinct.
- (24) Order Isoptera.
- (25) Order Zoraptera.
- (26) Order Psocoptera.
- (27) Order Mallophaga.
- (28) Order Anoplura.
- (29) Order Hemiptera.
- (30) Order Thysanoptera.

(Endopterygota)

- (31) Order Neuroptera.
- (32) Order Mecoptera.
- (33) Order Lepidoptera.
- (34) Order Trichoptera.
- (35) Order Diptera.
- (36) Order Siphonaptera.
- (37) Order Hymenoptera.
- (38) Order Coleoptera.
- (39) Order Strepsiptera.

(7) Class Crustacea

- (1) Subclass Cephalocarida.
- (2) Subclass Branchiopoda.
  - (1) Order Notostraca.
  - (2) Order Kazacharthra - extinct.
  - (3) Order Acercostraca - extinct.
  - (4) Order Conchostraca.
  - (5) Order Cladocera.
  - (6) Order Anostraca.
  - (7) Order Lipostraca - extinct.
- (3) Subclass Mystacocarida.
- (4) Subclass Euthycarcinoidea - extinct.
- (5) Subclass Copepoda.
  - (1) Order Calanoida.
  - (2) Order Cyclopoida.
  - (3) Order Harpacticoida.
  - (4) Order Caligoida.
  - (5) Order Monstrilloida.
  - (6) Order Lernaeoida.

(6) Subclass Branchiura.

(7) Subclass Ostracoda.

(1) Order Mydocopa.

(2) Order Cladocopa.

(3) Order Platycopa.

(4) Order Podocopa.

(8) Subclass Cirripedia.

(1) Order Acrothoracica.

(2) Order Rhizocephala.

(3) Order Ascothoracica.

(4) Order Thoracica.

(5) Order Apoda.

(9) Subclass Malacostraca.

(1) Order Leptostraca.

(2) Order Hymenosthraca - extinct.

(3) Order Archaeostraca - extinct.

(4) Order Eocaridacea - extinct.

(5) Order Pygocephalomorpha - extinct.

(6) Order Stomatopoda.

(7) Order Palaeocaridacea - extinct.

(8) Order Anaspidacea.

(9) Order Stygocaridacea.

(10) Order Bathynellacea.

(11) Order Spelaeogriphacea.

(12) Order Thermosbaenacea.

(13) Order Mysidacea.

(14) Order Tanaidacea.

(15) Order Isopoda.

(16) Order Amphipoda.

(17) Order Anthracocaridacea - extinct.

(18) Order Cumacea.

(19) Order Euphausiacea.

(20) Order Decapoda.

(8) Class Arachnida.

(1) Order Scorpiones.

(2) Order Pseudoscorpiones.

(3) Order Opiliones.

(4) Order Architarbi - extinct.

(5) Order Acari.

(6) Order Haptopoda - extinct.

(7) Order Anthracomarti - extinct.

(8) Order Trigonotarbi - extinct.

(9) Order Palpigrada.

(10) Order Schizomida.

(11) Order Thelyphonida.

(12) Order Kustarachnae - extinct.

(13) Order Phrynichida.

(14) Order Araneae.

(15) Order Solifugae.

(16) Order Ricinulei.

(9) Class Trilobita - extinct.

(10) Class Merostomata.

(1) Order Xiphosura.

(2) Order Eurypterida - extinct.

(3) Order Aglaspida - extinct.

- (11) Class Pycnogonida.
- (19) Phylum Pentastomida.
- (20) Phylum Tardigrada.
- (21) Phylum Chaetognatha.
- (22) Phylum Pogonophora.
  - (1) Class Frenulata.
  - (2) Class Afrenulata.
- (23) Phylum Echinodermata.
  - (1) Class Cystoidea - extinct.
  - (2) Class Eocrinoidea - extinct.
  - (3) Class Paracrinoidea - extinct.
  - (4) Class Crinoidea.
  - (5) Class Edrioasteroidea - extinct.
  - (6) Class Carpoidea - extinct.
  - (7) Class Machaeridia - extinct.
  - (8) Class Cyamoidea - extinct.
  - (9) Class Cycloidea - extinct.
  - (10) Class Stelleroidea.
    - (1) Subclass Asteroidea.
    - (2) Subclass Ophiuroidea.
    - (3) Subclass Auluroidea - extinct.
    - (4) Subclass Somasteroidea - extinct.
  - (11) Class Echinoidea.
  - (12) Class Holothuroidea.
- (24) Phylum Hemichordata
  - (1) Class Enteropneusta.
  - (2) Class Pterobranchia.
  - (3) Class Graptolithina.
- (25) Phylum Chordata
  - (1) Subphylum Tunicata.
    - (1) Class Ascidiacea.
    - (2) Class Thaliacea.
    - (3) Class Larvacea.
  - (2) Subphylum Cephalochordata.
  - (3) Subphylum Vertebrata.
    - (1) Class Agnatha.
      - (1) Order Osteostraci - extinct.
      - (2) Order Anapsida - extinct.
      - (3) Order Cyclostomata.
      - (4) Order Heterostraci - extinct.
      - (5) Order Coelolepida - extinct.

(2) Class Placodermi.

- (1) Order Petalichthyida - extinct.
- (2) Order Rhenanida - extinct.
- (3) Order Arthrodira - extinct.
- (4) Order Phyllolepada - extinct.
- (5) Order Ptyctodontida - extinct.

(3) Class Chondrichthyes.

- (1) Order Cladoselachii - extinct.
- (2) Order Pleuracanthodii - extinct.
- (3) Order Selachii.
- (4) Order Batoidea.
- (5) Order Chimaeriformes.

(4) Class Osteichthyes.

- (1) Order Climatiformes - extinct.
- (2) Order Ischnacanthiformes - extinct.
- (3) Order Acanthodiformes - extinct.
- (4) Order Palaeonisciformes - extinct.
- (5) Order Polypteriformes.
- (6) Order Acipenseriformes.
- (7) Order Semionotiformes.
- (8) Order Pycnodontiformes - extinct.
- (9) Order Amiiformes.
- (10) Order Aspidorhynchiiformes - extinct.
- (11) Order Pholidophoriformes - extinct.
- (12) Order Leptolepiformes - extinct.
- (13) Order Elopiformes.
- (14) Order Anguilliformes.
- (15) Order Notacanthiformes.
- (16) Order Clupeiformes.
- (17) Order Osteoglossiformes.
- (18) Order Salmoniformes.
- (19) Order Cetomimiformes.
- (20) Order Ctenothrissiformes.
- (21) Order Gonorhynchiiformes.
- (22) Order Cypriniformes.
- (23) Order Siluriformes.
- (24) Order Amblyopsiformes.
- (25) Order Batrachoidiformes.
- (26) Order Gobiesociformes.
- (27) Order Lophiiformes.
- (28) Order Gadiformes.
- (29) Order Atheriniformes.
- (30) Order Beryciformes.
- (31) Order Zeiformes.
- (32) Order Lampridiformes.
- (33) Order Gasterosteiformes.
- (34) Order Channiformes.
- (35) Order Synbranchiformes.
- (36) Order Scorpaeniformes.
- (37) Order Dactylopteriformes.
- (38) Order Pegasiformes.
- (39) Order Perciformes.
- (40) Order Pleuronectiformes.
- (41) Order Tetraodontiformes.
- (42) Order Crossopterygii.
- (43) Order Dipnoi

(5) Class Amphibia.

- (1) Order Temnospondyli - extinct.
- (2) Order Anthracosauria - extinct.
- (3) Order Nectridea - extinct.
- (4) Order Aistopoda - extinct.
- (5) Order Microsauria - extinct.
- (6) Order Proanura - extinct.
- (7) Order Anura (Salientia).
- (8) Order Urodela (Caudata).
- (9) Order Apoda.

(6) Class Reptilia.

- (1) Order Cotylosauria - extinct.
- (2) Order Mesosauria - extinct.
- (3) Order Chelonia.
- (4) Order Eosuchia - extinct.
- (5) Order Squamata.
- (6) Order Rhyncocephala.
- (7) Order Thecodontia - extinct.
- (8) Order Crocodilia.
- (9) Order Pterosauria - extinct.
- (10) Order Saurischia - extinct.
- (11) Order Ornithischia - extinct.
- (12) Order Araeoscelidia - extinct.
- (13) Order Sauropterygia - extinct.
- (14) Order Placodontia - extinct.
- (15) Order Ichthyosauria - extinct.
- (16) Order Pelycosauria - extinct.
- (17) Order Therapsida - extinct.

(7) Class Aves.

- (1) Order Archaeopterygiformes - extinct.
- (2) Order Hesperornithiformes - extinct.
- (3) Order Tinamiformes.
- (4) Order Struthioniformes.
- (5) Order Rheiformes.
- (6) Order Casuariformes.
- (7) Order Aepyornithiformes - extinct.
- (8) Order Dinornithiformes - extinct.
- (9) Order Apterygiformes.
- (10) Order Gaviiformes.
- (11) Order Podicipediformes.
- (12) Order Procellariiformes.
- (13) Order Sphenisciformes.
- (14) Order Pelecaniformes.
- (15) Order Ciconiiformes.
- (16) Order Anseriformes.
- (17) Order Falconiformes.
- (18) Order Galliformes.
- (19) Order Gruiformes (Ralliformes).
- (20) Order Diatrymiformes - extinct.
- (21) Order Icthyornithiformes - extinct.
- (22) Order Charadriiformes.
- (23) Order Columbiformes.
- (24) Order Psittaciformes.
- (25) Order Cuculiformes.

- (26) Order Strigiformes.
  - (27) Order Caprimulgiformes.
  - (28) Order Apodiiformes.
  - (29) Order Coliiformes.
  - (30) Order Trogoniformes.
  - (31) Order Coraciiformes.
  - (32) Order Piciformes.
  - (33) Order Passeriformes.
- (8) Class Mammalia.
- (1) Order Monotremata.
  - (2) Order Triconodonta - extinct.
  - (3) Order Multituberculata - extinct.
  - (4) Order Symmetrodonta - extinct.
  - (5) Order Pantotheria - extinct.
  - (6) Order Marsupialia.
  - (7) Order Edentata.
  - (8) Order Insectivora.
  - (9) Order Scandentia.
  - (10) Order Dermoptera.
  - (11) Order Tillodontia - extinct.
  - (12) Order Taeniodontia - extinct.
  - (13) Order Chiroptera.
  - (14) Order Primates.
  - (15) Order Creodonta - extinct.
  - (16) Order Carnivora.
  - (17) Order Pinnipedia.
  - (18) Order Condylarthra - extinct.
  - (19) Order Amblypoda - extinct.
  - (20) Order Cetacea.
  - (21) Order Sirenia.
  - (22) Order Desmostylia - extinct.
  - (23) Order Proboscidea.
  - (24) Order Perissodactyla.
  - (25) Order Hyracoidea.
  - (26) Order Embrithopoda - extinct.
  - (27) Order Notoungulata - extinct.
  - (28) Order Astrapotheria - extinct.
  - (29) Order Litopterna - extinct.
  - (30) Order Tubulidentata.
  - (31) Order Artiodactyla.
  - (32) Order Pholidota.
  - (33) Order Rodentia.
  - (34) Order Lagomorpha.
  - (35) Order Macroscelidea.

Animal Classification as in "Larousse Encyclopaedia of Animal Life" (Hamlyn, 1967) with modifications according to "Principles of Invertebrate Palaeontology" (Shrock and Twenhofel, 1953) for Phylum Parazoa (2), Bryozoa (10) and Echinodermata (23), Treatise on Invertebrate Palaeontology (Ed. R. C. Moore) for Phylum Arthropoda, Class Crustacea (18(7)) and Marine Life (George & George) for Pogonophora (22). Subphylum Vertebrata (25(3)) classified according to "Vertebrate Palaeontology" (A. S. Romer, 1966 3rd Edn.) with modifications to the Mammalia (23(4)8) according to "A World List of Mammalian Species (G. B. Corbet and J. E. Hill, 1980).



1. Room B.40, Geology Store (Basement)
2. Room B.45, Spirit Store (Basement)
3. Room B.66, Biology Store (Basement)
4. (4.1 - 4.12) Gallery display specimens (Ground Floor)
5. Room G.18, Keeper's Office (Ground Floor)
6. Room G.16, Assistant Keeper's Office (Ground Floor)
7. Room G.14, Recording Room (Ground Floor)
7. (a) Hall outside Offices (Ground Floor)
8. Room B.38, Natural History Laboratory (Basement)
  - (a) Room B.41, Identification Room
  - (b) Room B.42, Collection Data Room
9. Room B.43, Natural History Workshop (Basement)

#### Specimen Locality Codes

- |      |                         |
|------|-------------------------|
| 4.   | Specimens on display    |
|      | Natural History Gallery |
| 4.1  | Introductory area       |
| 4.2  | Limestone Grassland     |
| 4.3  | Moorland                |
| 4.4  | Urban                   |
| 4.5  | Deciduous               |
| 4.6  | Coniferous              |
| 4.7  | Heathland               |
| 4.8  | Field and Hedgerow      |
| 4.9  | Aquatic                 |
| 4.10 | Archaeology Gallery     |
| 4.11 | Decorative Arts Gallery |
| 4.12 | Ceramics Gallery        |