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Featured Institution

BIOLOGICAL RECORDS CENTRE

Unlike earlier articles on "Featured Institutions", the following covers an institution without a single specimen to its name - our stock in trade is information - "data" - on the occurrence of plants and animals in the British Isles. Also we have no displays or galleries - our contact with the public is mainly through publications and meetings, and at the end of a telephone. But, because so many museums are also local biological records centres, it is hoped that this article will be of interest.

INTRODUCTION

The Biological Records Centre (BRC) at Monks Wood is run by the Institute of Terrestrial Ecology (ITE) with support, under contract, from the Nature Conservancy Council (NCC). BRC's main objectives are:

1. To set up and operate a computerised data bank of information on the occurrence of the flora and fauna of the British Isles;
2. to maintain an archive of the original records from which the data bank was compiled;
3. to make the data it holds available for research and documentation, nature conservation and general information.

BRC co-ordinates the collection of most of its information through some 60 National Biological Recording Schemes (Annex I). These schemes are organised by, or with the assistance of, acknowledged experts in the relevant groups and draw mainly on records given voluntarily by naturalists, research workers, museums and records centres.

ORIGINS

The idea of enlisting the help of voluntary recorders to provide information for a national species mapping project, information which it would otherwise be uneconomic to collect, was pioneered by the Botanical Society of the British Isles for the Atlas of the British Flora (Perring & Walters, 1962).

The Biological Records Centre was set up in 1964 by what was then the Nature Conservancy, and had the objective "to collect distribution data for plants and animals in the British Isles". As head of BRC, Franklyn Perring achieved a great deal in publicising the centre and realising this objective, assisted, particularly with the invertebrates, by John Heath. Dr Perring left to become Secretary-General of the Royal Society for Nature Conservation in December 1978. He was succeeded as head by John Heath, who retired in January 1982. Since February 1982 Paul Harding has been head of BRC.

9. Locality (where recorded and sufficiently precise), numbered in relation to a gazetteer of place-names.

Some data sets include additional information which is codified (eg habitat, determiner, developmental stage and status). Extra information for records from museum collections or for taxonomically difficult groups is included where relevant (eg museum code and catalogue numbers, date of determination, compiler and date of compilation).

The basic computer files of records in the data bank have to be augmented with several ancillary files which act as "dictionaries" to numerically coded information. For example, the following are standard for all data sets.

1. Order, genus, species (sub-species etc) names using the current accepted scientific nomenclature. In a few cases vernacular names are included.
2. Recorder/determiner/compiler surnames and initials. These can be cross-referenced to separately-held mailing lists.
3. A gazetteer of place-names based on names used by the Ordnance Survey and the Suirbheireacht Ordonais on published maps. Where relevant, and where known, the conservation status of sites is also noted (eg National Nature Reserve; Site of Special Scientific Interest; County Trust, RSPB or other Nature Reserve, National Trust property). This gazetteer will be cumulative, as it is at only an early stage of development. It should provide a valuable tool in providing site-related data and eventually in automatically checking the grid references provided with records.

These additional fields with every record, listed above, the extra fields where appropriate, and the three "dictionary" files greatly increase the uses to which BRC's data may be put. At present the BRC computerised data bank consists of over 2.5 million records (Table 1).

Archive

It is BRC's aim eventually to have an archive of the originals or copies of the record cards etc from which the computerised data bank was compiled. This is seen as necessary if the validity of records in the data bank is ever queried; reference back to the original record often enables queries to be answered. Also, some record cards provide additional information which it is not always possible to codify for inclusion in the data bank.

In most cases the original cards are held in BRC, but where the scheme organiser prefers to retain the originals, at least for the time being, micro-film copies are made and held in BRC. Records of some groups, processed before the present policy of a supporting archive was introduced in 1980, (eg Non-marine Mollusca, Birds) are not yet backed up by record cards in the archive.

Record cards

To accommodate the need for additional information with each record, the design of BRC recording cards has been modified in recent years. There are still three basic types:

LOCATION

Monks Wood Experimental Station is the largest of the 9 ITE stations, and lies in a small haven of woodland amid the open arable landscape of west Cambridgeshire. The station has a total permanent staff of about 75, of whom 7 make up the BRC project group. The station was purpose-built in 1962/63 but has been added to in several phases (the latest will be completed in April 1984). BRC shares one wing of the original station buildings (formerly a caretaker's flat and stores block) with the Natural Environment Research Council Computing Services (NCS) facilities for the station.

STAFF

The present staff, almost all of whom have joined the centre within the last 5 years, has just increased to 7, with the welcome addition of a second invertebrate zoologist. All of us have duties or small research projects outside our work in BRC - this helps maintain an acceptable level of sanity in the group!

The present staff and their duties are:

Head - P T Harding

Administration of BRC in relation to Monks Wood and ITE matters, customers and users; resource planning.

Data Editor - Mrs D M Greene

Compilation and maintenance of computerised data bank; development of improved data handling. Day to day interaction with NERC Computing Services, Science & Engineering Research Council (SERC) Rutherford/Appleton Laboratories and the Terrestrial Environment Information System at ITE Bangor.

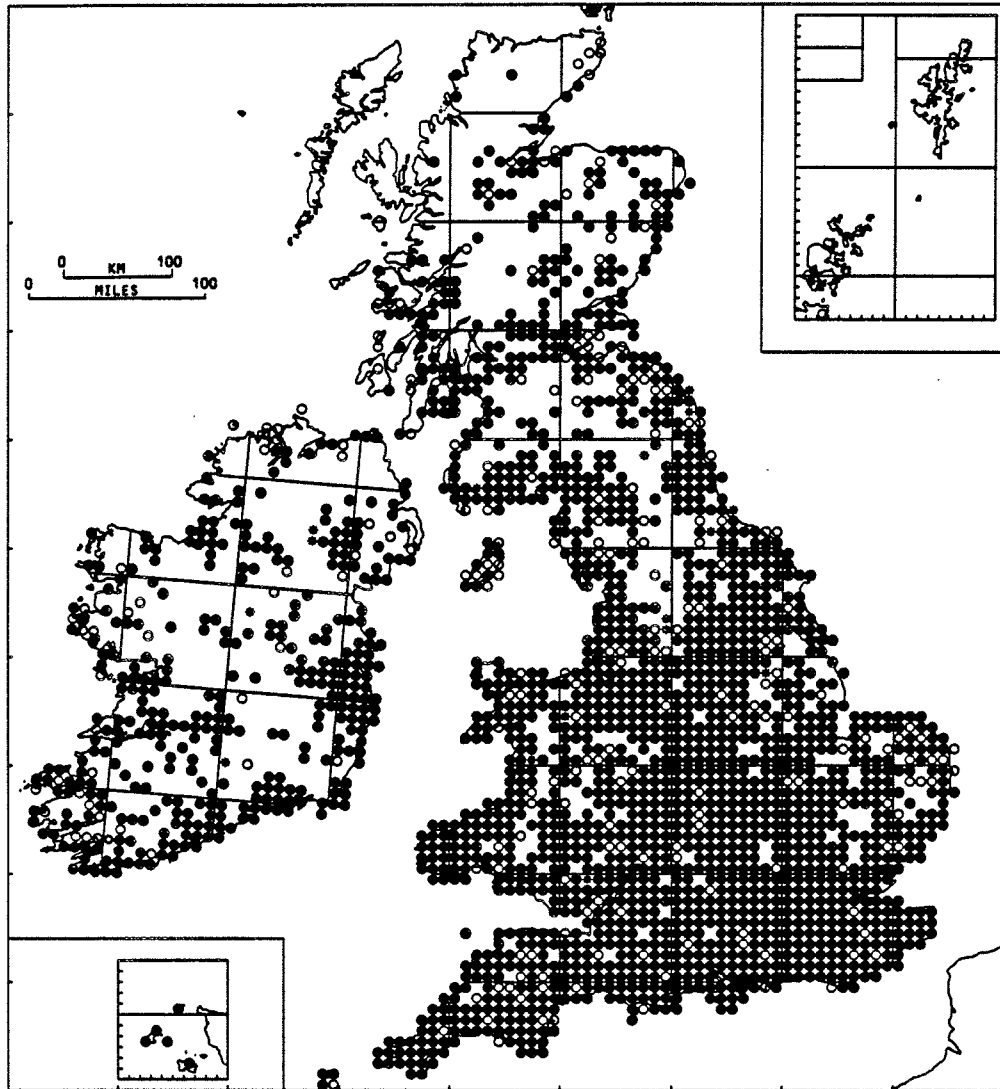
Recording Co-ordinators:

C D Preston	-	Plants
P T Harding)	-	Terrestrial and freshwater
B C Eversham)		invertebrate animals
H R Arnold	-	Vertebrate animals and marine invertebrate animals

Day to day contact with recording scheme organisers and other donors of data. Checking data at various stages prior to input to the data bank and archive, arranging publication of output from schemes, etc. Dealing with general enquiries related to schemes and requests for data.

Support staff - Miss R J Harper - data checking etc.
Mrs S M Weller - secretarial

FIGURE 1 FR80 map



LYCAENA PHLAEAS

COMPUTING FACILITIES

The computing facilities for the whole of Monks Wood are managed as a part of NCS, through which BRC has access to a mini-computer at Monks Wood, a DEC PDP 11/34 processor with 128K words of MOS memory. This is used for much of the preliminary work on data once they have been entered on computer file, checked, validated and edited. All the initial file sorting and structuring is done on the PDP; also listings and draft (line-printer) maps. The data bank is held on the IBM computer system at the SERC Rutherford/Appleton Laboratories using the G-EXEC management system. Distribution maps for publication are also run from the Rutherford/Appleton Lab using the FR80 high precision film recorder. This provides a map prepared by computer as a black and white bromide print (Figure 1).

WHAT IS A BRC RECORD?

In recent years BRC has been modifying its objectives and methods to enable greater use to be made of the data provided by recorders. It is no longer enough to know that an organism was recorded in a 10km square before or after an arbitrary date. Records of this type are only really of use for producing distribution maps, and can be misleading when put to other uses (eg demonstrating a decline in the occurrence, or the contraction of the distribution, of a species). To this end, wherever possible data put on computer file are derived from the original record cards completed by recorders and include as much information as possible. Scheme organisers are discouraged from compiling summarised "master cards" unless required for their own use; summarised records can only reduce the precision of the information and inevitable mistakes occur in copying records from one format to another. Clearly this is a reversal of BRC's earlier policy, and is only possible because of the increased computing facilities being used by BRC in recent years.

Data bank

To be able to fulfil the objectives given earlier, almost all data handled by BRC since the end of 1980 have been processed to create data bank files with at least the following "fields":

1. Order, genus and species code numbers (also where relevant, sub-species and variety)
2. Country (England, Wales, Scotland, Northern Ireland, Ireland (Eire), and Channel Islands)
3. Grid reference (all numeric, as complete as given by the recorder, up to 8 figures)
4. Watson/Praeger vice-county number
5. Date (as complete as given by the recorder)
6. Recorder code number
7. Altitude
8. Source (field record, museum collection, published record)

TABLE 1

DATA HELD BY BRC (December 1983)

	No. species (approx.)	No. records on computer file (approx.)	No. record cards in archive (approx.)
TOTALS	7,870	2,763,100	507,650
<u>Plants</u>			
Marine Algae (Seaweeds)	650	60,000	2,000
Characeae (Stoneworts)	48	5,000	5,000
Bryophyta (Mosses & Liverworts)	900	60,000	8,000
Vascular plants*	2,500	1,500,000	230,000
Myxomycetes (Slime moulds)*	320	25,000	100
<u>Terrestrial & Freshwater Invertebrate Animals</u>			
Non-marine Mollusca (Slugs and snails)*	200	140,000	18,000
Hirudinea (Leeches)	16	4,200	200
Diplopoda (Millipedes)	50	7,000	-
Chilopoda (Centipedes)	50	5,000	4,000
Odonata (Dragonflies)	54	28,000	20,000
Orthoptera, Dermaptera & Dictyoptera (Grasshoppers & Crickets, Earwigs, Cockroaches)	35	10,000	10,000
Lampyris noctiluca (Glow-worm)	1	-	150
Rhopalocera (Butterflies)	72	250,000	50,000
Macro-Heterocera (Macro-moths)*	1,500	300,000	50,000
Dixidae (Meniscus midges)	14	900	900
Siphonaptera (Fleas)	60	-	16,000
Aculeata Hymenoptera (Wasps, Bees and Ants)*	620	9,000	-
Cladocera (Water-fleas)	80	-	2,000
Crangonyx pseudogracilis (Water shrimp)	1	-	50
Non-marine Isopoda (Woodlice and Waterlice)	50	27,000	20,000
Pseudoscorpiones (False-scorpions)	26	-	4,000
Opiliones (Harvestmen)	24	3,000	3,000
Parasitinae (Mites)	50	-	200
<u>Marine Invertebrate Animals</u>			
Dinoflagellates	200	27,200	2,250
<u>Vertebrate Animals</u>			
Freshwater Fish	60	1,800	1,800
Amphibians & Reptiles	14	-	20,000
Birds*	218	285,000	-
Mammals	60	15,000	40,000

* These data bank files are mainly of summarised data

FIGURE 2 Species list card (RA 45)

Grid ref.	5302-19-	Habitat		Vice-county name			
		OPEN PARKLAND, MAINLY OAK & HAWTHORN		S. LINGS			
		Recorder	Determiner	Compiler	Date		
		A.B. DRANE	A.B.D.	P.T. HARDING	4 6 1 9 8 3		
VC No.	53	No. 3 2 7		No. 3 2 7		No. 9 9	
						Altitude	
LOCALITY	GRIMSTHORPE PARK SSSI	COLEOPTERA: CERAMBYCIDAE 6455					
		71801 Prionus coriarius		73101 Trinophylum cribratum			
		71901 Arhopalus rusticus		73201 Gracilia minuta			
71902 tristis		73301 Obrium brunneum					
72001 Asemum striatum		73302 cantharinum					
72102 Tetrodium gabrieli		73401 Nathrius brevipennis					
72201 Rhagium bifasciatum		73501 Molochus minor					
72202 inquisitor		73502 umbellatarum					
72203 mordax		73601 Aramia moschata					
72301 Stenocorus meridianus		73701 Hylotrupes bajulus					
72401 Acmaeops collaris		73801 Callidium violaceum					
72501 Grammoptera holomelina		73901 Pyrrhidium sanguineum					
72502 ruficornis		74001 Phymatodes alni					
72503 ustulata		74002 testaceus					
72504 variegata		74101 Clytus arletis					
72601 Alosterna tabacicolor		74301 Anaglyptus mysticus					
72701 Leptura fulva		74401 Lamia textor					
72702 livida		74501 Mesosa nebulosa					
72703 rubra		74601 Pogonocherus fasciculatus					
72705 sanguinolenta		74602 hispidulus					
72706 scutellata		74603 hispidus					
72707 sexguttata		74701 Leiopus nebulosus					
72801 Judolia cerambyciformis		74801 Acanthocinus aedilis					
72802 sexmaculata		74901 Agapanthia villosviridescens					
72902 Strangalia aurulenta		75001 Saperda carcharias					
72903 maculata		75002 populnea					
72904 melanura		75003 scalaris					
72905 nigra		75101 Oberea oculata					
72906 quadrifasciata		75201 Stenostola dubia					
72907 revestita		75301 Phytoecia cylindrica					
		75401 Tetrope praecusta					
COLEOPTERA: CERAMBYCIDAE 6455	Other species and comments						
	<u>P. TESTACEUS</u> BRED FROM PUPAE, OTHER SPECIES ADULTS						

FIGURE 3 GEN 7 card

ORDER		ISOPODA		GENUS & SPECIES		ARMADILLIDIUM		SUB-SPECIES			
6567		01003		NASATUM		Bulle-					
				Lund							
COMPILER		P.T. HARDING		SOURCE		(Collection/Reference)					
				Fid. Mus. Lit.		National Museum of Ireland, Dublin (NM. 28. 1938) Park Beaverford Collection					
Grid Reference		V.-C.		Collector / Recorder		Determiner		Locality		Date	
21/1-7-		207		R.A. PHILLIPS		P.T. HARDING		TEMPLEMORE		3.9.1922	
32/15-37-		221		?		P.T.H.		BOTANIC GARDENS GLASNEVIN DUBLIN		Jue 1938	
33/5-8-		238		?		P.T.H.		RANGOR		Jue 1938	
34/1-4-		239		?		P.T.H.		BALLYCASTLE		Jue 1938	
33/2-5-		238		N.H. FOSTER		P.T.H.		HILLSBOROUGH		Jue 1938	
31/5-7-		34		H.B. COTT		P.T.H.		BRISTOL		Juna 1932	
_____		100		A. PATIENCE		P.T.H.		BUTE		Jue 1938	

1. Species List/Field card (RA or RP series) (Figure 2) - contain a partial or complete species list for a taxonomic group. Used to record several species from one site.
2. One Species card (GEN 7 (A5) or GEN 12 (8" x 5")) (Figure 3) - used mainly for abstracting records from museum or private collections and herbaria or from species-based registers and lists.
3. Individual Record card (GEN 8 (A5)) (Figure 4) - used mainly to record a single observation of one rare species. The reverse of the card includes a simple population recording form. The 80 column card sized IRC (pink card) is still available.

All new schemes are adopting these types of cards. Existing schemes using older types of cards will continue to be provided with the relevant cards, although the present One Species cards (GEN 7 and GEN 12) have replaced earlier versions. An "Other Species" card is available for use with schemes where the Species List card does not include all the species found in the British Isles (eg vascular plants); it is available in two sizes - 8" x 5" (GEN 10) and A5 (GEN 9).

OUTPUT FROM BRC

Output from the BRC data bank and archive is available in a variety of forms. The availability of certain forms is, naturally, subject to some restrictions due to the confidentiality of some records, the magnitude of the request and the need of the requester for the information, etc. Requests for copies of "all the ... records held by BRC" are not uncommon. If it is for records of only one species, this may be possible; if it is for all the records of Carex species or of butterflies, it is unlikely to be possible unless there is a justifiable need for the information. Each request is assessed on its merits, and we hope that most reasonable requests are answered to the satisfaction of the requester. Much time could be spent merely re-cycling data when our main objective at present must be to accession new data.

Distribution maps

Maps are currently available via the line-printer at Monks Wood or the FR80 at the Rutherford/Appleton Lab. Line-printer maps are distorted but provide a useful draft for checking and initial assessment of the data used. The FR80 maps (Figure 1) are camera-ready and suitable for reproduction. Both maps show records by the 10 km squares of the National Grid in Great Britain and the Irish National Grid. It is possible to produce line-printer maps of 50 km square and vice-county records. Both the line-printer and the FR80 are able to use a variety of symbols, most commonly to distinguish date periods of records.

FIGURE 4 GEN 8 card

ORDER VASC. PLANT		GENUS & SPECIES CAREX MAGELLANICA Lam.										SUB-SPECIES	
VICE-COUNTY		LOCALITY 403 (=C. PAVPERCULA) BUTTERBURN FLOW										ALTITUDE m.	
CUMB.												ALTITUDE ft.	
V-C No.	70	GRID REFERENCE	35662766	STATUS	✓	INT	ESC	MIG	CAS	UNK	900		
RECORDER/COLLECTOR		D.A. RATCLIFFE										D.A.R.	
DETERMINER		D.A.R.										D.A.R.	
STAGE		Ova		Nymph		Skin		Seedling		FL.		ASPECT	
		♂		♀								Sphagnum sedge in	
Larva		Pupa		Shell		♀		Adult		Juv		Habitat	
												Mantle bog.	
SOURCE		Field sedge										SLOPE	
COMMENTS		First part 1930 record											

Biological Records Centre

October 1980

GEN 8

Listings

Theoretically, listings of records can be produced in any combination of the principal components of a record: Species/Grid reference/Vice-county/Date/ Locality. In practice, as work on a data set is completed, the records are listed by species (in grid reference sequence), by 10 km squares (as a sequence of species records arranged by dates) and by vice-counties (in grid reference and then species sequence). A few listings by sites have been prepared but only on an experimental basis.

Publications

Numerous atlases of distribution maps have been published by BRC, ITE or other publishers using maps prepared by BRC. The format is probably familiar now to most naturalists in the British Isles. ITE continues to publish provisional and "final" atlases which are available for sale from ITE Headquarters, 68 Hills Road, Cambridge CB2 1LA. Increasingly, these atlases include more than just distribution maps; brief commentaries on the maps, describing, for example, the habitats of species and distribution outside the British Isles, are now seen as essential. Recent examples (Elliott & Tullett, 1982; Ing, 1982; Seaward & Hitch, 1982; and Heath, Pollard and Thomas, in press) have developed the idea of commentaries to maps introduced by Perring & Sell (1968), Harding (1976) and Sharrock (1976).

Other types of publications which make use of data held by BRC have concentrated mainly on distribution maps. However, in recent years several people have worked on data, including analytical work on data for Orthoptera and butterflies. For example, Milligan (1983) used approximately 10,000 records of Orthoptera to examine various statistical techniques applied to habitat and geographical data..

Users

Apart from the general and wide use of BRC distribution maps, what other uses of data and users are there?

Nature Conservancy Council - NCC supports BRC as a national centre for holding information on species distribution and occurrence. Through the present 3-year contract (April 1982-March 1985), NCC provides approximately 1/3 of the running costs of BRC. Under the contract BRC carries on its main data collection and processing, but is also committed to develop means of providing NCC with data which can be related to statutory conservation sites.

Other Nature Conservation bodies - There is little evidence of extensive use by, for example, the voluntary nature conservation bodies. As BRC's ability to produce site-related data improves, it is probable that its data will become of increasing use to anyone wishing to know "what species occur at this site?".

Research - Professional and amateur research workers and students make considerable use of data held by BRC (see above). Whilst we are happy for this use to take place, it can be time-consuming and relatively unproductive for BRC. One of ITE's main interests in BRC's data for the future will be their use with other data sets on, for example, land use, geology, soils and climate. Also, with sufficient historical information, it will be possible to use BRC data to examine changes in the flora and fauna over time.

General enquiries - BRC is used as a source of information, often of a fairly general nature, by a wide variety of organisations, including the media, and by individuals. Operating an information bureau can be time-consuming but is rewarding, and clearly fills a need.

THE NATIONAL BRC AND LOCAL RECORDS CENTRES

Since the publication of the Handbook for Biological Records Centres (Flood & Perring, no date), several new local centres have been set up. The flow of data, from recorders in the field to local centres, the national recording schemes and the national centre, outlined in Handbook has rarely operated satisfactorily. BRC has changed considerably and is now able to undertake a wider range of operations.

A joint Biology Curators' Group/Biological Records Centre survey of local records centres was conducted in 1980 (appendix to BCG Newsletter Vol 2 No 8), the results of which were summarised by Harding & Greenwood (1981) and Greenwood & Harding (1982). A comprehensive survey of species recording schemes in local biological records centres was made by Whiteley (1983).

BRC has been host during the last few years to visitors from several local centres seeking either advice on recording systems and BRC's own operation or records, mainly from our archives. We have been very pleased to help our colleagues from local centres and look forward to continued and hopefully closer co-operation.

However, it is clear that a fresh dialogue on biological recording is necessary; BCG is planning a conference for local centres later this year.

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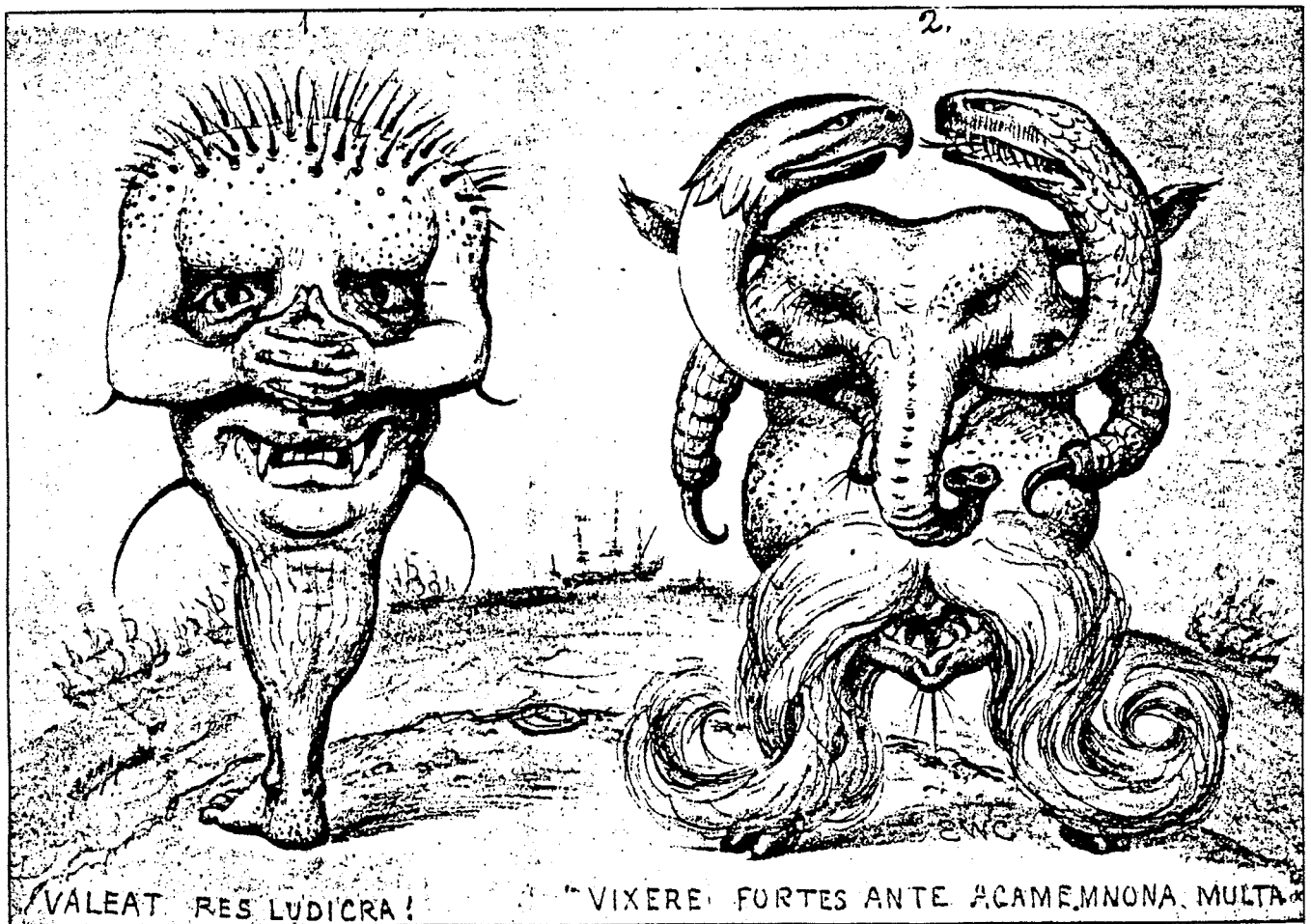
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1985 Diploma Practical Questions!

(E.W.Cooke, Grotesque Animals, 1872)

NATIONAL BIOLOGICAL RECORDING SCHEMES

BIOLOGICAL RECORDS CENTRE

Institute of Terrestrial Ecology, Monks Wood Experimental Station,
Abbots Ripton, Huntingdon, Cambs. PE17 2LS
Telephone: Abbots Ripton 381

PLANTS - BRC co-ordinator: Mr C D Preston

MYXOMYCETES - Slime moulds

Dr B Ing, Chester College, Cheyney Road, Chester, Cheshire CH1 4BJ

DIATOMS

Dr R W Battarbee, Department of Geography, University College, 26 Bedford Way,
London WC1H 0AP

MARINE ALGAE - Seaweeds

Professor T A Norton, Department of Marine Biology, Port Erin, Isle of Man.

CHARACEAE - Stoneworts

Mrs J Moore, Botany Dept, British Museum (Natural History), Cromwell Road,
London, SW7 5BD

LICHENS

Dr M R D Seaward, Postgraduate School of Studies in Environmental Science,
University of Bradford, Bradford BD7 1DP

BRYOPHYTA - Mosses and Liverworts

Dr A J E Smith, British Bryological Society, Dept of Botany, University
College of North Wales, Bangor, Gwynedd LL57 2UW

VASCULAR PLANTS - Flowering Plants and Ferns

Botanical Society of the British Isles, c/o Mr D A Wells, Nature Conservancy
Council, Godwin House, George Street, Huntingdon, Cambs. PE18 6BU

MARINE INVERTEBRATES - BRC co-ordinator: Mr H R Arnold

PROTOZOA - Marine Dinoflagellates

Dr J D Dodge, Dept of Botany, Royal Holloway College, Huntersdale, Callow
Hill, Virginia Water, Surrey GU25 4LN

POLYZOA - Bryozoa

Dr P Hayward, Dept of Zoology, University College of Wales, Swansea SA2 8PP

MOLLUSCA - Marine Molluscs

Mr D R Seaward, 3 Summerlands, Yeovil, Somerset BA21 3AL

CRUSTACEA: MALACOSTRACA

REPTANTIA - Marine Crabs

Dr R Ingle, Dept of Zoology, British Museum (Natural History), Cromwell Road, London SW7 5BD

ISOPODA - Marine Isopods

Dr R J Lincoln, Dept of Zoology, British Museum (Natural History), Cromwell Road, London SW7 5BD

ECHINODERMATA - Echinoderms

Dr A J Southward, Marine Biological Association of the United Kingdom, The Laboratory, Citadel Hill, Plymouth PL1 2PB

TERRESTRIAL & FRESHWATER INVERTEBRATES

BRC Co-ordinators: Mr P T Harding & Mr B C Eversham

PLATYHELMINTHES: TURBELLARIA: TRICLADIDA - Freshwater Flatworms

Dr L S Bellamy, Gloucester City College of Technology, Brunswick Road, Gloucester GL1 1HU

MOLLUSCA - Non-marine Molluscs (Snails and Slugs)

Dr M P Kerney, Conchological Society of Great Britain and Ireland, c/o Dept of Geology, Imperial College, Prince Consort Road, London SW7 2AZ

ANNELIDA: OLIGOCCHAETA - Freshwater Oligochaetes

Mr R W Martin, Severn-Trent Water Authority, Minworth Laboratories, Kingsbury Road, Minworth, Sutton Coldfield, West Midlands B76 9DP

DIPLOPODA - Millipedes

Mr D T Richardson, 5 Calton Terrace, Calton Road, Skipton, N. Yorks BD23 2AY

CHILOPODA - Centipedes

Mr A D Barber, Dept of Science & Mathematics, Plymouth College of Further Education, Kings Road, Devonport, Plymouth PL1 5QG

EPHEMEROPTERA - Mayflies

Dr S P Nicholls, 8 Fairacre Close, Purdown, Lockleaze, Bristol BS7 9TW

ODONATA - Dragonflies & Damselflies

Mr R Merrett, 48 Somersby Avenue, Walton, Chesterfield, Derbyshire

ORTHOPTERA - Grasshoppers & Crickets
DERMAPTERA - Earwigs
DICTYOPTERA - Cockroaches

Mr E C M Haes, 45 Grove Road, Worthing, Sussex BN14 9DQ

HEMIPTERA:

AQUATIC HETEROPTERA - Water bugs

Mr J H Blackburn, Freshwater Biological Association, River Laboratory,
East Stoke, Wareham, Dorset BH20 6BB

AUCHENORHYNCHA - Leafhoppers and froghoppers

Dr W J Le Quesne, Anne Cottage, 70 Lye Green Road, Chesham, Bucks HP5 3NB

(HETEROPTERA STUDY GROUP - Mr B C Eversham, c/o Monks Wood Experimental
Station, Abbots Ripton, Huntingdon, Cambs. PE17 2LS)

NEUROPTERA - Lacewings
MECOPTERA - Scorpion-flies
MEGALOPTERA - Alder-flies and Snake-flies

Dr M A Kirby, Towneley Hall Art Gallery & Museums, Towneley Hall, Burnley,
Lancs. BB11 3RQ

COLEOPTERA - Beetles

CARABIDAE - Ground beetles

Dr M L Luff, Dept of Agricultural Biology, The University, Newcastle-
upon-Tyne NE1 7RU

AQUATIC COLEOPTERA - Water beetles

Dr G N Foster, Balfour-Browne Club, 20 Angus Avenue, Prestwick, Ayr KA9 2HZ

ELMIDAE - Riffle beetles

Mr D G Holland, North West Water Authority, Rivers Division, c/o
P O Box 12, Warrington WA1 2QG

STAPHYLINIDAE - Rove beetles

Mr P M Hammond, Dept of Entomology, British Museum (Natural History),
Cromwell Road, London SW7 5BD

ATOMARIINAE & PTILLIIDAE

Mr C Johnson, Dept of Entomology, Manchester Museum, The University,
Manchester M13 9PL

COCCINELLIDAE - Ladybirds

Mr J Muggleton, MAFF, Slough Laboratory, London Road, Slough, Berks.
SL3 7HJ

ELATEROIDEA - Click beetles

Mr H Mendel, c/o The Museum, High Street, Ipswich, Suffolk IP1 3QH .

CHRYSOMELIDAE - Leaf beetles

BRUCHIDAE - Pulse beetles

Dr M L Cox, Commonwealth Institute of Entomology, Dept of Entomology,
British Museum (Natural History), Cromwell Road, London SW7 5BD

CERAMBYCIDAE - Longhorn beetles

Mr J Cooter, 222 Whittern Way, Tupsley, Hereford HR1 1QP.

ELM SCOLYTIDAE - Elm bark beetles

Bark Beetle Research, c/o Dr C P Fairhurst, Dept of Biology, University
of Salford, Salford M5 4WT

TRICHOPTERA - Caddisflies

Dr I D Wallace, Keeper of Invertebrate Zoology, Merseyside County Museums,
William Brown Street, Liverpool L3 8EN

LEPIDOPTERA - Moths and butterflies

RHOPALOCERA - Butterflies

Mr R D Sutton, The British Butterfly Conservation Society, 19 Corner
Close, Wellington, Somerset TA21 8QE

OECOPHORIDAE

Mr M Hadley, Nature Conservancy Council, 19/20 Belgrave Square,
London SW1X 8PY

INCURVARIIDAE and HELIOZELIDAE

Dr K P Bland, 35 Charterhall Road, Edinburgh EH9 3HS

MICROPTERIGIDAE and ERIOCRANIIDAE

Mr J Heath, 104 Needingworth Road, St Ives, Huntingdon, Cambs
PE17 4JY

DIPTERA - Flies

Co-ordinator of the Central Panel of Diptera Recording Scheme Organisers:
Mr A E Stubbs, Nature Conservancy Council, 19/20 Belgrave Square, London
SW1X 8PY

TIPULOIDEA & PTYCHOPTERIDAE - Craneflies

Mr A E Stubbs (as above)

DIXIDAE - Meniscus midges

Dr R H L Disney, Field Studies Council, Malham Tarn Field Centre,
Settle, North Yorkshire BBD24 9PU

CULICIDAE - Mosquitoes

Dr N R H Burgess, Dept of Army Preventive Medicine, Royal Army Medical
College, Millbank, London SW1P 4RJ

LARGER BRACHYCERA - including Horseflies, Robberflies, Beeflies
and Soldierflies

Dr A G Irwin, Natural History Department, Castle Museum, Norwich,
Norfolk NR1 3JU

SYRPHIDAE - Hoverflies

Mr P F Entwistle, NERC Institute of Virology, Mansfield Road, Oxford
OX1 3SR

CONOPIIDAE

Mr K G V Smith, Dept of Entomology, British Museum (Natural History),
Cromwell Road, London SW7 5BD

SEPSIDAE

Mr A C Pont, Dept of Entomology, British Museum (Natural History),
Cromwell Road, London SW7 5BD

SCIOMYZIDAE - Snail-killing flies

Dr I F G McLean, Nature Conservancy Council, 19/20 Belgrave Square,
London SW1X 8PY

SIPHONAPTERA - Fleas

Mr R S George, 8 St Peter's Street, Duxford, Cambs. CB2 4RP

HYMENOPTERA

ACULEATA - Solitary and Social Wasps, Bees and Ants

Mr G R Else, Dept of Entomology, British Museum (Natural History),
Cromwell Road, London SW7 5BD

CRUSTACEA

CLADOCERA - Water-fleas

Mr J Hearn, 3 Waverley Way, Carshalton Beeches, Surrey SM5 3IQ

ISOPODA - Non-marine Isopods (Woodlice and Water Slaters)

Mr G D Fussey, Biology Dept, Repton School, Repton, Derby DE6 6FH

ARACHNIDA

PSEUDOSCORPIONES - False scorpions

Dr G Legg, The Booth Museum of Natural History, Dyke Road, Brighton,
Sussex BN1 5AA

OPILIONES - Harvestmen

Mr J H P Sankey, 3 Glenrose, Old London Road, Mickleham, Dorking,
Surrey RH5 6BY

ARANEAE - Spiders

Dr P Merrett, British Arachnological Society, c/o Furzebrook Research
Station, Wareham, Dorset BH20 5AS

ACARI: METASTIGMATA - Ticks

Mr K P Martyn, Dept of Zoology, British Museum (Natural History),
Cromwell Road, London SW7 5BD

TARDIGRADA - Tardigrades

Dr M D Hooper, Monks Wood Experimental Station, Abbots Ripton, Huntingdon,
Cambs. PE17 2LS

VERTEBRATES - BRC co-ordinator: Mr H R Arnold

AGNATHA AND PISCES - Lampreys & Freshwater fish

Mr M P Langhelt, 31 Nant Fawr Crescent, Cyncoed, Cardiff CF2 6JN

AMPHIBIA AND REPTILIA - Amphibians and Reptiles

Mr H R Arnold, Monks Wood Experimental Station, Abbots Ripton, Huntingdon,
Cambs. PE17 2LS

AVES - Birds

British Trust for Ornithology, Beech Grove, Tring, Herts. HP23 5NR

MAMMALIA - Mammals

Mr H R Arnold, Monks Wood Experimental Station, Abbots Ripton,, Huntingdon,
Cambs. PE17 2LS

December 1983