British Mycological Society promoting fungal science

British Mycological Society Recording Network

Guidance Notes

COLLECTING AND RECORDING FUNGI

A revision of the *Guide to Recording Fungi* previously issued (1994) in the BMS *Guides for the Amateur Mycologist* series.

Edited
by
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Foreword

In June 2000 the British Mycological Society Recording Network (BMSRN), as it is now known, held its Annual Group Leaders' Meeting at Littledean, Gloucestershire. One of the outcomes of the meeting was a decision to revise and bring up to date the *Guide to Recording Fungi* written by Jack Marriott in the series *Guides for the Amateur Mycologist*. Lengthy consultation followed and there was much debate about what should be included in the guide. A glance at the index will indicate the wide coverage attempted – from tips on collecting and recording fungi to advice on complex databases. Some readers will find sections of the text to be statements of the obvious, whereas others may find the same text too advanced, or containing references to computer technology that may be difficult to understand. Others may be frustrated that topics that could have been included have been left out. Hopefully, however, all will find something to interest them in this revision.

Computer technology moves forward very quickly. The BMS Fungal Records Database (BMSFRD) can be expected to change over the next few years. It is thought that any re-print of the guide in booklet form would have a very limited shelf-life. A decision was therefore taken to enter the text onto the BMS web pages as a guidance note on collecting and recording fungi. A limited number of copies will be printed and circulated to Local Recording Groups and copies can also be made available to others at the cost of printing plus postage. The version on the BMS web pages will be brought up to date at intervals as necessary.

This guidance note has been collated and edited by Richard Iliffe, with help from a number of contributors. Some of Jack Marriott's earlier text has been retained. Alan Braddock prepared a preliminary draft of the sections on computing. John Wheeley provided much of the chapter on BMSFRD, and Malcolm Storey advised on computer databases. Tom Hering helped to bring the section on plant taxonomy into line with current thinking, and Paul Kirk did the same for fungal taxonomy. Derek Schafer contributed the wording on intellectual property rights. Helpful suggestions were received throughout from Ted Blackwell, Bert Brand and Jack Marriott and the draft was checked and approved by Paul Kirk and Shelley Evans. Final editing may have led to changes to the text of earlier contributors and the Editor accepts responsibility for any minor errors that may have been introduced. The initial request for a review of the guide came from Shelley Evans in her former role as BMS Recording Network co-ordinator, and the final document is circulated with the approval of the current co-ordinator of BMSRN, Liz Holden

Richard Iliffe
April 2004

Introduction

Over the past two centuries the British Isles have suffered increasing levels of industrial and atmospheric pollution. Large areas of open countryside have been lost to housing, roads and commercial development. Modern agriculture has converted much of our landscape into hectare upon hectare of silent monoculture. Many of our rivers, canals and small watercourses have been severely contaminated by nitrate fertiliser run-off from farm-land and by industrial waste products. On a worldwide scale there is concern at forecasts of global warming.

The Rio Earth Summit in 1992 focused world attention on the need for urgent action to combat threats to the environment. In the UK a series of Biodiversity Action Plans was prepared, aimed at conserving endangered species and threatened habitats, operating at both national and regional levels. Red Data Lists were produced to draw attention to species most at risk. These political efforts stimulated an unprecedented expansion of biological recording to monitor endangered populations.

More recently, the turn of the millennium offered a target date for natural history surveys, generating intensive recording activity. One of the most ambitious surveys was 'Atlas 2000', undertaken by the Botanical Society of the British Isles (BSBI). This involved five years of nation-wide recording by our most skilled botanists. Published in 2002 the report is a comprehensive assessment of the status of our vascular plants. Another recording achievement was the Millennium Atlas of Butterflies of Britain and Ireland, a survey of the status of breeding and migrant butterflies following five successive summers of recording by teams of dedicated lepidopterists.

Field mycologists have also contributed. During the millennium year a national effort was made to try to record 2000 different fungi. It achieved a total in excess of 3300 species, not including the lichenised fungi. Largely through the enthusiasm of individuals working under the auspices of the British Mycological Society there has been a much-increased public awareness of the role of fungi in the environment. There is now a better understanding of the need to conserve them and to work towards the preservation of threatened habitats. Recent work on recording waxcaps and other declining grassland fungi has resulted in the conservation listing of a number of valuable and previously unprotected sites in the British Isles.

To carry our conservation actions into the future we need data, and yet more data, on a nation-wide scale. A glance at the 950,000 or so fungus records in the BMS Fungal Records Database in January 2004 reveals that the spread of records is patchy. Many areas of the country are under-recorded or under-reported. There are Local Fungus Recording Groups distributed around the country; thirty-six at the time of writing (see Appendix 8). There are also many enthusiastic field mycologists working independently. The potential is there for a significant increase in scientific mycological recording.

This Guidance Note tries to cover briefly all the procedures involved in recording fungi, starting with the basic principles of collecting and making records, and then going on to advise on some of the problems encountered in computerised management of data. Its aims are to encourage more individuals and groups to make systematic records of their local fungi, and to submit those records to the national database.

Recording

Why is recording important? We keep records because it is part of human nature to wish to know more about our surroundings. Among the more practical reasons for individuals and groups to keep fungus records are to:

- contribute records towards preparation of a county or regional mycota.
- add to the knowledge of local and national distribution of fungi.
- compare past finds with those of the present day.
- contribute to knowledge of the biodiversity of an area or a specific site.
- enable reliable local and national Red Data Lists to be compiled.
- assess the mycological value of sites subject to planning applications.
- prepare courtesy lists of species for owners or managers of sites visited.
- submit records to a local Natural History Society or Wildlife Trust.

Collecting fungi

Advice on the basics of collecting fungi and on the detailed observations that should be made in the field and back in the workroom is given in the first of the '*Guides for the amateur mycologist*' series: '*Guide for the Beginner*' by Jack V.R. Marriott (see Appendix 1). In some respects that publication is now somewhat dated. Some of the recommended field guides are now out of print, and the network of local recorders and area organisers, originally set up by Jack Marriott, has evolved over the years to become a network of local fungus recording groups distributed throughout the country. The booklet, however, remains among the best available introductions to field mycology.

This Guidance Note would be incomplete without some mention of both good and bad collecting practice, as it is a common occurrence for identifications to fail because fundamental procedures have been ignored. It is important that good field notes are made ***at the time of collection***. It is unwise to rely on memory to recall such details as the substrate (referred to as the 'medium' in the original *Guide to Recording*) on which the specimen was growing, or the associated organism, such as the tree(s) under which it may have been found.

For collecting large specimens open baskets are commonly used, particularly the wide shallow ones that are popular on the Continent but not easy to find in this country. Small delicate specimens should be collected with care and placed in closed plastic divided boxes such as those sold in angling accessory shops and DIY stores, or in individual plastic containers e.g. those used for photographic films, or for medicinal tablets. Plastic bags should never be used – the specimens sweat and deteriorate very quickly. It can be helpful to enclose a leaf of a relevant tree inside the container, or a slip of paper with a number or letter cross-referenced to a comment in a field notebook or tape-recorder.

Back home, specimens can be stored in a closed plastic container in a domestic fridge, but should be examined as soon as possible, preferably within 24 hours. If this is not possible a description of the vital field characters should be made and the specimens dried promptly for later investigation, or for passing on to an expert referee.

Even though most of the basic rules of collecting make obvious sense they are often ignored. Try to avoid the temptation to make a quick collection with the fingers – use some form of digging tool or a knife. It is so easy to become casual about this. If the species looks to be a

common one, why bother to take care? If it appears to lie outside your particular speciality are you less careful? Many quite skilled field mycologists dislike some groups and may take less care when picking, say, a *Mycena*, *Psathyrella*, *Panaeolus* or *Inocybe*. These finds, possibly snapped off at the base, will then be offered to a specialist in these genera without the essential knowledge of whether they were 'rooting', or from buried wood, whether the extreme base was swollen or of a different colour from the stem. We can all plead guilty to these 'crimes' at one time or another.

When fresh specimens of agarics and boletes are collected they should be carefully checked for transient features like a scent, or veil fragments on the cap margin, liquid droplets on the gills or pores, cobwebby cortina on the cap margin or on the ring zone of the stem, or cystidia on the stem; usually visible with a hand lens as a hairy-velvety appearance or pruination. Avoid handling stems if possible. For some genera, such as *Inocybe* and *Hebeloma*, keys may ask if minute hairs are confined to the upper third of the stem or are visible over the whole length! In group situations or public forays such features can be lost as an interesting specimen is passed from hand to hand, each person rolling the stem in the fingers! This may be unavoidable, but the recorder should ensure that other untouched samples are safely collected and tucked away in containers for future determination.

When collecting more robust specimens like polypores it is recommended that each collection be placed in a paper bag, ideally with a fragment of the woody substrate, or a leaf of the relevant tree if living. For the softer, fleshier species, some form of closed container is recommended. For very tiny specimens a few stems of moss can be added to maintain the moisture content. Identification keys may ask whether the fungus caused 'brown rot' or 'white rot' so it is worth learning how this can be determined from the appearance of the affected wood. Identification of the tree type or species can be important. This is often difficult with dead wood but there is a key available for determining tree species: *Identifying woods in the field* by E. Blackwell in issue 7 of BMS Keys (For lists of BMS Keys see Appendix 9). It has also been published in *Field Mycology* Vol. **5** (1) January 2004.

Most field mycologists now use tape recorders for field records though some still prefer notebooks. Notebooks have the advantage that they cannot be deleted or 'written over', nor do they fail unaccountably or need new batteries! Notebooks can be stored for future reference whereas tapes are generally re-used. The choice is, however, a matter of personal preference – the importance is that some form of record is taken. Whichever method is used the records will have to be transcribed later into some other form, either to a field book, to foray record sheets, to a final foray list of species, or directly into a computer database.

Access to foray sites and the country code

During the final decade of the twentieth century increasing concern was expressed at the threats to our environment at local, national and world levels. Much publicity has been given to increasing commercial and industrial development, pollution, acid rain, loss of the ozone layer and global warming.

Protest groups like Greenpeace and Friends of the Earth have grown to become international organisations and, following the Rio Earth Summit in 1992, many governments have responded to demands for changes in environmental perception. Following recent legislative reviews Sites of Special Scientific Interest (SSSI) have been afforded greater protection and there is improved access to some areas of the countryside. These changes have, however, generated new responsibilities and, in the interests of conservation, some authorities

have become more cautious in granting access to individuals and groups wishing to study natural history and to collect specimens for the furtherance of those studies. To ensure that fungus groups and individual field mycologists continue to be welcome there are standards of behaviour that we should always maintain when out on a foray.

Permission to make group visits to sites should always be obtained. Even where managed land is open to the public it is courtesy to notify rangers and wardens of proposed visits. Letters of thanks for group visits should always be sent, with a list of species. If nothing more, this will ensure a welcome for future visits. Good countryside practice should be followed; property should be respected, all gates should be left as found, walls and fences should not be climbed where there is no stile or obvious access point. Locked field gates should be climbed near the hinges – they are not designed to carry heavy loads at the latch end. It is also much safer to climb an old gate where it is strongest, near to the post.

Dogs should be kept under close control, litter should be taken home, noise levels kept low, and fire risks avoided. Repetitive collecting by all participants on a foray should be discouraged, and on no account should edible species be collected from nature reserves, or from private land unless the owner has given permission.

Be aware that some public open spaces are subject to local bye-laws that may prohibit collecting. If in doubt obtain clarification when asking permission for access. Truffle hunters have been criticised in the past, perhaps unfairly. The nature of their searches, sometimes using rakes, may do short term damage to the local environment and the results can look unsightly, though few now engage in this activity in this country. Those who do should gain permission in the same way as others, taking care to explain the scientific nature of their truffle survey. The highly valued edible species found on the Continent are not present in the UK so commercial or social collecting of truffles is not a feature of our society.

One of the first principles of collecting is to leave the environment as close as possible to the state in which it was found. Don't litter the surroundings with discarded specimens, and if logs have to be rolled over ensure that they are turned back to their former position. Minimum quantities should be collected when investigating wood inhabiting species or collecting bracket fungi (a small wedge taken from the side is often sufficient). These recommendations are not just for the tidy-minded – they help to conserve invertebrates and other forms of life.

Four fungal species are legally protected from collection, even for scientific purposes, by Schedule 8 of the Wildlife and Countryside Act 1981, which prohibits their 'intentional picking, uprooting or destruction'. The Act only applies to England, Scotland and Wales, not Northern Ireland, the Republic of Ireland, the Channel Islands or the Isle of Man. The species covered are *Hericium erinaceum* (Bearded Tooth), *Buglossoporus pulvinus* = *Piptoporus quercinus* (Oak Polypore), *Boletus regius* (Royal Bolete) and *Battarrea phalloides* (Sandy Stiltball). Licences for collection of these species can be obtained by application to the appropriate authority (English Nature, Scottish Natural Heritage or the Countryside Council for Wales). Please see Appendix 12 for the implications of the Drugs Act 2005 on field mycology.

Spore prints

Most readers of this text will be familiar with methods of taking spore prints, and of the need to do this as a first step towards identification after sorting the contents of a collecting basket. Don't be tempted to store specimens in a fridge before setting up spore prints as the chilling can slow down the release of spores and may inhibit spore drop completely.

Spore prints should be obtained from woody polypores before they are dried, stored or treated to kill insects. If the polypore specimen appears very dry after collecting store it in damp newspaper overnight in a cool place and then place a piece of the fresh hymenium pore side downwards over a glass slide inside a closed plastic container. The specimen should be set so that the tubes are vertical, as they are in nature, otherwise the spores cannot escape. One way of achieving this is to insert pins to varying depth in the underside of the specimen and use these as 'adjustable legs' to level it properly. It may help if a small piece of wet tissue is placed in the container to maintain the humidity that is essential if spores are to drop.

Field books

Mycologists have personal methods of treating field notes when they return to the workroom or laboratory. Some maintain a Field Book. This may be used for entering hand-written lists of species found at a given site, with spaces left for names of unknowns to be added later, after identification. Others use the Field Book for sketches and detailed macro and micro descriptions of unknown species, working towards a tentative or a confirmed identification with a note of references to relevant literature. Some mycologists, possibly the majority, accumulate loose sheets of paper with sketches, notes, spore measurements, which they may later clip to, or file with, their lists of foray finds. The method used is immaterial, but some system should always be employed so that information on doubtful or rare records can, if required, be retrieved and sent to a specialist for checking. The discipline of taking detailed notes also aids identification as observation will be more thorough and key features will not be overlooked or forgotten.

Difficult species are often identified days, or even months, after being collected, so good field notes are essential. It goes without saying that the notes should be kept in a safe place, not just discarded after the specimen has been named. It may be that some records will cause a raised eyebrow. There are many common species that most recorders will accept without back-up notes, particularly if they could be expected in the specific habitat where recorded. If, however, an unnamed, or a named but new or very uncommon species is found a 'referee' is likely to ask for a fresh or dried specimen with accompanying field notes. A small sketch or coloured illustration or a photograph will then be very helpful. Failing such evidence, the record may be rejected (or reduced to genus name only), particularly if it is a species rare in Britain, or one that is considered to be very unlikely with the stated associated organism or substrate, or to be found in a particular locality or ecosystem. Aim to acquire the reputation of being a careful identifier. If there is any doubt at all about the identity of a fungus, signal the fact. Better still, attempt to have it confirmed by a more experienced person. This will provide a higher quality and more useful record.

Anyone reading this Guide as a novice identifier/recorder should ensure that records are confirmed by an accomplished mycologist. If trying, with varying degrees of success, to identify mushrooms and toadstools from a Field Guide obtained in a local bookshop, contact your nearest Fungus Recording Group (See the list in Appendix 8). They will be pleased to have your records, and you will get help and encouragement in your study of fungi.

Index cards

This was the time-honoured way of keeping records and can be perfectly satisfactory. One could opt for having one record, or several, per card. If opting for the one record per card, then a small card, of size 5 × 3 inches, or the metric equivalent, and ruled feint, will be quite sufficient. With the name of the fungus in the top left hand corner, the genus, group, type or order can be entered

in the top right hand corner, the other categories of information can be placed on successive lines of the card. This will make for easy scanning of the cards for any item of information.

The back of the card can be used for any sketch of the fungus and of some of its microscopic elements and for other items such as whether a specimen has been kept and where; or a photograph taken, or any notes on its identification. If opting for several records per card, a larger card is required, certainly not less than 6x4 inches or the metric equivalent. Again, the name, genus or order can be entered on the top line. For the remainder of the information, the card would be ruled vertically to divide the space into a number of columns corresponding to the various items of information to be entered and each of such width that the information fits in easily.

Sample index card

SPECIES						ORDER etc		
Site name and Grid Reference		**Date**	**Ecosystem**	**Associated Organism**	**Substrate**	**Collector**	**Identifier**	**Notes**

In this example the ecosystem can be one of the ecosystem codes prepared by the Nature Conservancy Council (NCC), as it was then known, or just your best interpretation of the habitat. A table of the NCC codes is provided in Appendix 3. The associated organism will be the tree, plant, insect, other fungus, with which the specimen appears to be associated, and the substrate is whatever it appears to be growing on: soil, rotten wood, living wood etc. A list of terms is provided in the chapter on the BMSFRD. The identifier is the person who made the identification, often the collector, but the name of a more experienced referee can be included here as the confirmer. The name of the fungus should be the key to indexing on cards. This will enable easy sorting for fungus names.

Computers

The most efficient method of storing and manipulating large numbers of records is in digital format by use of a computer. Recording is simple and rapid: the computer program prompts you for the various items required in turn, and corrections can easily be made. Keyboard short cuts provided by a database program will enter information with a minimum of effort and avoid typing mistakes, particularly if one of the recording programs associated with entering data into the BMSFRD is used (e.g. MycoRec). With one key-stroke one might enter all the parameters referring to a particular foray i.e. the date, grid reference, location, altitude and ecosystem, thus leaving only the species name, substrate, associated organism and collector/identifier details to be added.

Searching can be rapid and thorough: in a matter of seconds you can obtain, for example, a list of all the records for a particular species, or all those associated with a given tree or other organism, or all those from a named site, or of all those meeting selected criteria. Printing of a sorted list is readily accomplished. Batches of records or even complete databases may easily be

copied or sent electronically to other recorders. In today's computerised world records are realistically of value to the local Natural History Society, or the county Wildlife Trust only if they can be entered into their respective databases.

If records are to be provided to these databases they will have to be supplied in some digital format (unfortunately it is likely that the formats used by these different organisations will differ, but this problem is gradually being overcome). This should not be a problem for the larger fungus groups, which will almost certainly have at least one computer expert within their membership. However, the lone keen mycologist or the very small group may have a problem and they will have to look for outside help to convert their written records into digital format. It should be stressed here that it is the records that are important. The method of recording, or the manner in which records are entered into a computer is less so. The BMSFRD Manager and Co-ordinator have the skills to accept computerised data in most forms and to manipulate it to suit the requirements of the national database.

With older records it cannot be expected that much more than the fungus name, the locality, the date and possibly the collector will be available. The grid reference and the vice-county could be added by the compiler. Even though such records would now be regarded as incomplete, they are still of great value for local and national records. For such abbreviated data the recorder may prefer to prepare a simplified database. This is acceptable – the incomplete data will be welcomed provided the few basic elements referred to above are included. The important message is that records in almost any electronic format can be accepted. If in doubt contact the Database Co-ordinator.

Foray record sheets (see Appendix 2)

These are intended primarily as aids to getting data from field observations into a computer database and are the sheets currently used at residential BMS forays. Each sheet can be used for records from one site, or from a number of sites. The information on the completed sheets can be entered into the computer quickly and efficiently. Because the indexing is by site the sheets are not ideal as a means of keeping personal or group records. Note that when earlier forms were printed the term medium was used to denote the substrate on which the fungus was found. Copies of the form are available at any major BMS foray or can be obtained by application to the Society Librarian (address given in Appendix 1).

Literature for the identification of fungi

The British Mycological Society has published a *Guide to the Literature for the Identification of British Basidiomycetes* (2001). For the committed field mycologist this contains a comprehensive list of European reference works including field guides, general keys, keys to selected families, monographs and references to papers in scientific journals. The most helpful books and keys are singled out and some are recommended as helpful to beginners, though 'beginner' is a relative term and those just taking up an interest in fungi will be better served by inexpensive field guides in the local bookstore. Information on how to obtain a copy of this Guide is given in Appendix 1.

Help with identification

A number of field mycologists have offered to provide help with the identification of genera or groups of fungi in which they take a special interest. Their names, addresses and specialities are listed in Appendix 6. When sending material to them you should provide descriptions of the

specimens submitted, noting particularly smell, colour when fresh, texture and any other features that may change with time or when dried. Include sketches of microscopic characters if possible i.e. spores, cystidia, etc. and give a reference to any books or keys that you have used in your own attempts at identification.

You should also give the site location, habitat and substrate. Unless specifically stated to the contrary most field mycologists prefer to work with fresh material so you should send specimens while still in good condition, using first class post, wrapped in grease proof paper or kitchen foil (never polythene bags), and protected in a cardboard or plastic box or container. Dry kitchen roll can be used as packing, but never be tempted to include moistened paper tissue as this sticks to the specimens and accelerates the decay process. Damp moss helps to maintain freshness.

Dried material can be placed inside a sealed envelope but must be inside a box to prevent crushing in the post. If sending fresh material it is essential that you check by telephone beforehand to ensure that the intended recipient is at home and willing to accept it. Boxes of putrefying fungi on the doormat are a poor welcome home after a holiday! Remember to enclose a stamped addressed envelope, unless you can correspond by e-mail.

Drying specimens for a reference collection 'herbarium'

There are several good reasons for drying specimens, in addition to the attractive one of preserving edible species for later consumption. During an expedition, or a foray extending over several days, the collector is likely to have more material than can be examined in the short term. Drying by an approved method preserves the microscopic features of the fungus and they can be reconstituted later during determination. In other circumstances, if a collector working alone has identified something new or unusual, say a new county record, or a national red data list species, or even just an unfamiliar fungus where a second opinion is required to confirm the identification, it may not always be easy to get a specimen to an 'expert' within the few days that it remains in a recognisable fresh state. Drying it gives all parties time to do a relaxed identification, possibly months after the collection was made. A third reason is that following determination of an unusual or interesting specimen it is well worth storing it indefinitely in a personal, a local, or a national reference collection, so that it is available as voucher material for study by others at some future time.

Dryers can be purchased from specialist suppliers but the field mycologist handling only a few specimens at any one time can achieve perfectly satisfactory results by rigging up some form of open mesh tray over a domestic radiator. In the summer months, when the central heating is switched off, some form of home-made drier can easily and effectively be contrived in the form of a box or tin with a mesh cover to carry the specimens and the use of a low wattage electric light bulb as a heat source. A domestic oven on the lowest setting with the door left open has been suggested but this is not recommended as the specimens may become cooked or burnt.

After thorough drying, which may take several days, the specimens will store indefinitely in paper envelopes, ideally with a spore print on paper or on a glass slide enclosed. Details of the collector, identifier, date and grid reference should be written on, or stored inside, the envelope. The dried material must be stored in dry conditions, ideally with a more or less constant temperature, preferably with some insect deterrent material nearby, and it should be examined occasionally to ensure that the collection remains free from mould or insect attack.

Woody polypores can be preserved in the same manner, though they may need to be left over the heat source for a longer period until thoroughly dry. Large specimens can be cut down

by making a radial slice, ensuring that typical features are preserved. After drying ALL specimens should be placed in a deep freeze at around -20°C for about seven days to kill infecting insects. With these precautions they can be stored in paper envelopes and should remain unchanged for many years, though it is sensible to examine them at intervals for signs of deterioration.

The Herbarium at the Royal Botanic Gardens at Kew houses the national collection of fungi, comprising in excess of 250,000 specimens, not including the bulk of the lichenised fungi which are stored at the Natural History Museum in London. Collections are also held at the Royal Botanic Garden in Edinburgh, CABI Bioscience, and some regional museums. Kew has, however, traditionally been acknowledged as the reference centre for identification of fungi and field mycologists have always been encouraged to submit named specimens for confirmation and for inclusion in the national collection.

In recent times economies and re-organisations have led to reductions in the professional taxonomic staff, and Kew has insufficient resources to identify routine collections made by groups or individuals on forays. It does, however, still provide an informal identification service for those rare or difficult species that have defied local expertise. Specimens submitted for identification should be dried, and accompanied by a full macroscopic description with collection details, including the name of the collector, the date, and grid reference of the location, and with accompanying identification notes and a suggested name. Other welcome submissions are of good, identified, properly prepared and described material for the national collection - even of common species, collections of which may be incomplete or need replacement. Specimens can also be added to the 'duplicate' collection for international exchange.

BMS Slide Collection

The Society's photographic slide collection is available to all members for the purposes of lecturing and generally promoting mycology. Newer members may be glad of information about the material available and the arrangements for borrowing.

The collection comprises around 4000 transparencies; most genera of macrofungi, rusts, some microfungi, lichens (including the British Lichen Society collection), some Myxomycetes and some plant diseases are represented, together with a selection of mycological people and places.

To borrow slides, please give at least three weeks' notice; listing them alphabetically within taxonomic groups would be helpful, but not essential. The loan is for a maximum of four weeks, although extensions can be negotiated; there is no charge.

This is an active and well-used collection and new and improved contributions are always most welcome. At present slides are available for publication only within the BMS and with the permission of the photographer and the BMS.

The collection is currently housed in the BMS office at the Royal Botanic Gardens, Kew. Please send all offers, requests and correspondence to:

Gill Butterfill, BMS Slide Collection, BMS Office, The Wolfson Wing, Jodrell Laboratory, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB
Telephone: 020 8332 5720 E-mail: g.butterfill@rbgkew.org.uk

Taxonomy & nomenclature

The keen field mycologist, who may be asked to take on the responsibilities of Recorder to a local group, is expected to understand how both fungi and plants are classified. How does he or she acquire this knowledge? Popular field guides seldom give information on how species are named, or how they are arranged into genera and families. The science of naming things may be thought to be beyond the interests of the reader. More advanced texts and keys often omit these subjects – possibly on the assumption that users have had a university education and so have an understanding of taxonomy and nomenclature. The following notes offer an introduction to these essential and interesting subjects.

Taxonomy

Taxonomy is the science of biological classification. We arrange organisms in a hierarchy of groupings in accordance with our understanding of evolutionary relationships. These groupings or taxa (singular taxon) have an orderly relationship to each other. At the top of the hierarchy is the Kingdom: Animals, Plants, Fungi, Bacteria, Chromista and Protozoa. Bacteria are usually split into Eubacteria and Archaebacteria. Viruses are classified separately as non-cellular organisms. Each Kingdom is arranged into a series of taxa each less generalised than the one above. The table below gives the arrangement for Fungi, taking *Agaricus campestris* as an example. In some cases these are further sub-divided (or united). For example, classes may be split into subclasses, or united into a super-class. The species is the most fundamental unit of the system, but within some species it is possible to recognise smaller units, such as subspecies, varieties or forms.

Kingdom - Fungi

Phylum - Basidiomycota

Class - Basidiomycetes

Order - Agaricales

Family - Agaricaceae

Genus - *Agaricus*

Species - *campestris*

Recent changes in plant taxonomy

Many fungi associate with plant material. When naming ‘associated organisms’ of fungi it is helpful to have some understanding of the taxonomy of the higher plants. The Plant Kingdom has seven divisions (six of them covering sea-weeds and other forms of algae). Green plants are in the phylum Chlorophyta, which is further split into two sub-phyla: Chlorophycotina (more green algae), and Embryophytina (forming embryos and including mainly, but not exclusively, the terrestrial plants). The next taxonomic level is class, but plants are first divided into two superclasses: Bryophyta and Tracheophyta. Bryophyta contains three classes comprising the mosses, liverworts and hornworts.

Tracheophyta contains the vascular plants i.e. those with a vascular system which conducts water and nutrients. It contains six classes comprising ferns, horsetails and club mosses, and the gymnosperms and the angiosperms. These last two names have now disappeared, as indicated below, though the terms are still used colloquially, and will no doubt continue to be used for years to come as generations of botanists are so familiar with them. Similarly, the terms monocotyledons and dicotyledons are now officially defunct, though they also may remain in use for some time.

Conifers, cycads and ginko (formerly Gymnospermidae) are now in class Pinopsida

Flowering plants (formerly Angiospermidae) are now in class Magnoliopsida

The Magnoliopsida contains two sub-classes:

Liliidae – lilies, orchids, palms, sedges, rushes, reeds, grasses (formerly Monocotyledonae).

Magnoliidae – the broad-leaved plants, usually with two seed-leaves (formerly Dicotyledonae).

To take taxa further would consume too much space in this Guidance Note, though it is worth mentioning three families. The rushes are Juncaceae (including the genus *Juncus*) and the sedges are Cyperaceae (including the genus *Carex*). Grasses were formerly Gramineae but are now the Poaceae, but as with many such changes the old name may remain in common usage for some time.

For an inexpensive and easy to follow reference to names of plants the reader is referred to Collins *Pocket Guide to Wild Flowers of Britain and Northern Europe* (New Edition) by Fitter, Fitter and Blamey published in paperback in 1996 by Harper Collins. This lists plants under headings giving the English family name, followed by the current Latin name, and with the obsolete name in brackets e.g. Mint Family, Lamiaceae (Labiatae). The names of British plants in this popular wild flower guide are those used in the *New Flora of the British Isles* (2nd edition 1997) by Clive Stace, and D H Kent's *List of Vascular Plants in the British Isles* (1992).

For grasses the standard popular work has been *Grasses* by C E Hubbard, published in paperback by Pelican, and still available. It has been around since 1954 and has been reprinted many times. Collins publish a *Guide to the Grasses, Sedges, Rushes and Ferns of Britain and Northern Europe* by Fitter, Fitter and Farrer. Both of these books were last reprinted in 1984. They may not be taxonomically up to date, but the common and Latin names of the species covered have not changed greatly since publication. Grasses are also included in Stace and grass specialists can refer to this flora for the latest in grass taxonomy.

Recent changes in fungal taxonomy

Fungi have been less well studied than plants and in consequence fungal taxonomy is much less stable. With much current research at the DNA level we can anticipate yet more changes as it seems that many of the familiar macroscopic structures have evolved several times so do not indicate a relationship. The taxonomic hierarchy to the level of class is given below. For the complete and up to date taxonomic structure reference should be made to the 9th edition of Ainsworth and Bisby's *Dictionary of the Fungi* published in 2001. It can be obtained by

application to CABI Publishing, CAB International, Wallingford, Oxon, OX10 8DE. It can be purchased on-line at www.cabi-publishing.org

Within the kingdom Fungi are the following phyla:

Ascomycota
- class Ascomycetes
- class Saccharomycetes (the ascomycetous yeasts)
- class Schizosaccharomycetes (the fission yeasts)
- class Taphrinomycetes

Basidiomycota
- class Basidiomycetes
- class Urediniomycetes (Rusts)
- class Ustilaginomycetes (Smuts)

Chytridiomycota (mostly microscopic aquatic fungi)
- class Chytridiomycetes

Zygomycota
- class Zygomycetes (includes bread moulds)
- class Trichomycetes (associated with insect larvae)

Conidial fungi (also termed anamorphic fungi). These are fungi forming asexual conidia, where the sexual sporing stage has yet to be discovered. They were previously referred to as the Deuteromycetes (Fungi imperfecti).

Mycologists continue to study organisms in the Oomycota and Myxomycota, although they are no longer considered to be fungi. For much of the 20th century, all fungi were considered to constitute a single kingdom, the Fungi; but the present view is that Myxomycetes (slime moulds) and their allies are better placed in the kingdom Protozoa, while the Oomycetes, which have cellulose walls, belong in the kingdom Straminipila, along with certain chlorophyll-containing lower plants. The kingdom Fungi still contains all the other groups.

Orders of fungi

The 1994 edition of the *Guide to Recording Fungi* gave the complete list of the orders of fungi current at that time. Each of the 94 orders was given a two-character code, which had to be entered onto the old record sheets for entry to the BMSFRD.

The list of orders has since been revised and extended and there is little prospect that orders of fungi will remain stable in the long term. It may be possible to devise a simple code system that can take account of complex changes but the two-character codes have been abandoned. Instead, the position of species in the current classification system is recorded in a separate database.

The codes are no longer required as the BMSFRD, linking the two databases together, provides a simple means of selecting and/or sorting records. Some field mycologists regret the passing of the order codes as they provided a simple method of sorting records into the familiar groupings of fungi in a single database. There is no reason why recorders should not continue to use the codes for their own purposes, or devise a coding system to meet their own requirements. The old codes are, however, no longer relevant to the BMSFRD and should not be included in any data submitted. If left in place they will be deleted by the Database Co-ordinator. The table of orders in use in 2004 is printed alphabetically in Appendix 4 as a source of reference, and for comparison with the table of orders included in earlier editions of the *Guides for the Mycologist*.

Nomenclature

Historically, the naming of living things was given scientific structure in the mid-eighteenth century by the Swedish naturalist Carl von Linné (Linnaeus). He is credited with devising the binomial system which gives living organisms a two-part Latin name: a generic name, followed by a specific name, or epithet. He included descriptions and names of a few fungi in his *Species Plantarum* in 1753. At that time Latin was the common tongue of educated people throughout Europe, especially the aristocracy and clergy. The system was universally accepted and is still in use today. The understanding of fungi was vastly improved by the studies of C. H. Persoon in Holland and those of the Swedish botanist, Elias Fries. Persoon's work included especially the Gasteromycetes, rusts and smuts and he published lists of these fungi in 1801. Fries was the leading authority of the day on the agarics and other microfungi and macrofungi and his work was first published in 1821. These two publications of Persoon and Fries are regarded as critical in the naming of these respective groups of fungi; they either confirm or over-ride the original names of Linnaeus and others who published between 1753 and 1801 or 1821. Persoon and Fries have the status of 'sanctioning' authors. Authorship of names is indicated by the use of internationally agreed abbreviated forms for the names of authors; these are written after the Latin names of the fungi where precision is required.

To give an example, the fungus we know as the Fly Agaric was named *Agaricus muscarius* by Linnaeus and he is credited by the addition of L. after the name. Elias Fries accepted the specific epithet *muscarius* in 1821 and he is credited by the addition of ':Fr.'. C.H. Persoon gathered together from Linnaeus's broad grouping of *Agaricus* those species which he recognised as having some features in common and placed them in a new genus *Amanita* Pers. in 1797. The abbreviation Pers. following the generic name gives him credit for creating the new genus. He subsequently transferred the Fly Agaric into this genus and named it *Amanita muscaria*.

Currently, therefore, the scientific name of the Fly Agaric can be written *Amanita muscaria* (L.:Fr.) Pers. Note that the bracketed term relates to the specific epithet, and the abbreviation that follows applies to changes to the generic name. The terms after the Latin name are the 'author citation'. A similar example is given by *Amanita crocea* (Quél.) Kühner & Romagn. This tells us that Quélet introduced the epithet *crocea* and that Kühner & Romagnesi later placed it in the genus *Amanita*. Note that it is convention to start the generic name with a capital letter, but in modern usage the specific epithet is always written in lower case, even when an individual is honoured, e.g. *Agaricus bernardii*.

Biological nomenclature has four sets of rules, for animals, for plants, for bacteria and, recently, for viruses, and these differ in detail. In the 19th century the Botanical Rules were adopted for all kinds of fungi, and this continues to be so, even though it now appears that, in their evolutionary history, fungi are more closely related to animals than to green plants. The naming of both plants and fungi is controlled by the International Code of Botanical Nomenclature. This Code is subject to modification at six year intervals at meetings of the International Botanical Congress. To comply with the International Code any newly discovered species of plant or fungus has to be given a Latin (or latinized) binomial together with a description or diagnosis in Latin. Another rule is that the 'Rule of Priority' applies – that is, when two names have been used at different times for the same fungus the name first validly published usually prevails. Since 1953 a further requirement is that the Latin description must relate to a 'type specimen' stored in an indicated herbarium. At first sight these rules seem straightforward, so one might ask "Why do names keep changing?"

There are various reasons:

- Names have been carelessly applied in the past, with inadequate reference to older literature. The older name is discovered later and usually takes precedence.
- The same fungus may have been given different names in the past by workers in different countries. Modern communications help to eliminate this problem today but many old duplicate names still exist and await clarification.
- Type specimens preserved in museum collections when re-examined are found to differ from the modern understanding of the species concerned. The old name usually has to survive, so occasionally a species with which we have become familiar has to be given a new name. This becomes very confusing when both of these 'species' have to be recognised.
- New technology, particularly DNA analysis, reveals hitherto unknown relationships, leading to changes in both generic and specific names.
- Poor co-operation between mycologists in different countries (or even within the same country!) where opinions on taxonomy and nomenclature may differ and each worker publishes his own views. This is a problem that will always exist and may be regarded as an unavoidable consequence of 'the advancement of science'!

Synonymy

During the late nineteenth and much of the early twentieth century there were many workers on fungi, in this country and spread across Central and Eastern Europe and Scandinavia. With slow methods of communication, or none at all, it was inevitable that some species would be given many different Latin names. *Melanophyllum haematospermum* is an uncommon but distinctive small toadstool with bright red gills and with spores which may be shades of green in colour, changing to red as they dry. This species has had up to 23 different names, or synonyms. The sequence, showing how the name was changed over time by different workers, is set out by Jack V. R. Marriott (1994) in his chapter on Nomenclature and Taxonomy in No. 2 of the BMS *Guides for the Amateur Mycologist* series: *Guide to Identification with a Microscope*. This booklet is essential reading for beginners in mycology wishing to expand their skills and interests (see Appendix 1).

With the progressive development of the BMSFRD it has been necessary to include all the known synonyms and to design a system to recognise them and to add the name currently in use. This has taken the pressure off the recorder to keep up to date with changes in taxonomy and nomenclature, but care has still to be taken to ensure that only appropriate synonyms are used, and that they are spelt correctly. If sending in records using a name with a known problem of interpretation it helps if the literature used during identification is noted. This gives the Database Co-ordinator/Manager a clear indication of the sense in which the name has been used.

Morph

The table of fields of the BMSFRD includes a field for Morph. This is a term that puzzles many and calls for some explanation. A 'perfect' fungus is one that produces spores sexually i.e. it will have either asci or basidia. Some macrofungi and many microfungi also produce asexual spores (referred to in some publications as mitospores) e.g. conidia, and this is regarded as an 'imperfect' form of reproduction. In those fungi that have more than one method of reproduction the term **teleomorph** is applied to the state producing sexual spores, and **anamorph** to the state, or states, which produces asexual spores. The term **holomorph** is applied to these same fungi to indicate the whole fungus, incorporating all its spore stages. When entering records the

telemorph name should be used, with its morph code, e.g. *Tubercularia vulgaris* (the anamorph of *Nectria cinnabarina*) could be entered as '*Nectria cinnabarina*' with morph code A. If you specialise in the ascomycetes, or the conidial (anamorphic, imperfect) fungi or the rusts you will be familiar with these terms and know what to enter. If your interests are not in this area you can ignore this field.

The spore stages of rust fungi

Rust fungi are interesting and complex in that in some the same species can be found on two different host plants at different times, where they may produce spores of up to five different types. The five possible spore stages are indicated by the Roman numerals 0, I, II, III, and IV; use the morph field to indicate the spore stages present when recording rusts. For a clear explanation of these spore stages you should refer to the excellent *Guide for the Amateur Mycologist: 5. Downy Mildews, Powdery Mildews, Smuts and Rusts* by T. F. Preece (see Appendix 1).

BMS Small Grants Scheme

Funds are available from the Small Grants Scheme to promote mycology in a wide variety of ways. The amount available for any one undertaking is unlikely to exceed £300 but what it can be used for is entirely up to your imagination. Mycologists, as individuals or as groups, might need help:

- to travel to meetings
- with fieldwork or research projects
- to buy books or scientific equipment
- to hire meeting rooms or sponsor field trips or forays
- to support the cost of preparing applications to the Awards for All Lottery Fund for mycological projects.

These Grants are open to all categories of member AND non-members of the Society. They should not be used to support travel and/or accommodation at BMS-organised scientific meetings. Awards will not be made to supplement existing postgraduate awards or replace institutional funding for undergraduate or postgraduate research.

Support for attendance at meetings will be considered only if: other supporting funds are available; the applicant is presenting a paper or poster; the application is submitted normally at least four months prior to the meeting. Normally only one person from any one research group will be supported to attend the same meeting.

Applications based on hardship will be considered sympathetically (and, of course, confidentially). The basic criterion is that the award is used to promote mycology.

Normally retrospective applications will not be considered and only one application per person will be considered in any one calendar year. Forms for application can be downloaded from the BMS website at:

http://www.britmycolsoc.org.uk/resources.asp?Cat=Application%20forms

and are also available by post from the General Secretary, Dr. Geoff Robson Faculty of Life Sciences, 1.800 Stopford Building, University of Manchester, Manchester M13 9PT

Deadlines for applications are:
20th March, 20th June, 20th September, 20th December in any year.

A brief history of fungus recording

Reliable biological recording became possible in the mid-eighteenth century when the binomial system of naming species was promoted by Linnaeus. Over the following two centuries explorers, biologists and botanists travelled the world collecting and naming new species, and our great museums and natural history collections were created. The British Mycological Society first produced records of the fungi found on its Autumn Forays in 1899 and on Spring Forays in 1909. The lists of species found on forays appeared in the *Transactions*, then in the *News Bulletin*, and finally in the *Bulletin* up to the 1983 Autumn Foray. The reports simply listed the fungi found and indicated the location but usually gave no further information. Recording cards (Cross-off cards), produced in consultation with the Biological Records Centre at Monks Wood, were made available in 1973. However, no official recording scheme was initiated at that time.

The cards were similar in pattern to those used for recording insects, mammals, flowering plants, etc. The first card listed 'Macromycetes', that is, it contained a selection of the more common species of Agaricales, Boletales and Russulales, as well as of gasteromycetes, aphyllophorales, heterobasidiomycetes and ascomycetes. A few years later similar cards for discomycetes, gasteromycetes and myxomycetes were produced. The records obtained using these cards were to be incorporated in the general biological records at Monks Wood. These cards were site-based and required general information about the site but gave no room for details now regarded as useful (if not absolutely necessary) such as the associated organism, the substrate on which the fungus was growing and the ecosystem. The cards are, therefore, no longer in general use. An ambitious recording scheme was started in 1981, concentrating initially on the gasteromycetes. This scheme was successful and resulted in the publication of a provisional census in 1983. The first volume of an Atlas of British Fungi, devoted to the gasteromycetes, was published in 1994/5.

With the advent of the personal computers, it became clear that they provided a convenient and efficient way of recording fungi. The concept of a BMS database to hold the records made by both amateur and professional mycologists was mooted by David Minter in 1986. With computers it would be possible to incorporate in each record more details on the organism with which it was associated, the nature of the substrate on which it was found, the ecosystem and other details. The scheme rapidly took form and in May 1987 a computer was for the first time brought to a Foray where forayers tried their hand at inputting the information and daily printouts were produced. The computer then became part of the paraphernalia of each Spring and Autumn Foray. Lists, in the form of computer printouts, were sent to all participants giving detailed information in a way not possible in the Society's journals. The number of records on the database increased rapidly and at the end of 1993 it stood at about 40,000. From 1997 records from the herbarium at Kew (RBG Kew Mycology Section) and the IMI herbarium (the International Mycological Institute, now part of CABI Bioscience) were added. At the BMS Group Leaders' Meeting held at Littledean in 1999 Jerry Cooper and Paul Kirk introduced and demonstrated a revised and more user-friendly database with much increased capacity and this was given the formal title of the British Mycological Society Fungal Records Database (BMSFRD). At the same time, MycoRec (see page 25 for more information) was demonstrated and made available for use. Many more records were added, partly as a result of the considerable increase in the number of local recording groups. The number of entries to the database at the time of writing, January 2004, is approaching 1,000,000. There are still many geographic and taxonomic 'gaps' but we can now look forward to a time when the database contains a nation-wide distribution of fungus records.

The BMS Fungal Records Database (BMSFRD)

The following pages introduce the BMSFRD table structure and provide guidance to those wishing to submit records for inclusion. For those ambitious enough to want to build their own recording database, advice on the required structure, syntax and content is given.

One of the prime reasons for collecting records in the BMSFRD is to allow subsequent interrogation on a range of themes that include species distribution, frequency, and time of appearance, host association and site lists. Unless records are entered into the database in a consistent format and style it is difficult to extract all the useful information.

The current BMSFRD table structure together with rules and recommendations for use is given below. This structure has been enhanced since the database first appeared, and may well be subject to further enhancements, but these are unlikely to radically alter it or the data it contains. Some of the field formats that are specified below have been the subject of discussion and may not suit all recorders. If you wish to vary these, then you must be aware of the need to convert records when submitting them to the BMSFRD.

It is strongly recommended that new records should include as an absolute minimum the fungus name, date, identifier, locality and grid reference. Anything less than this considerably diminishes the value of the record. For historic records it is recognised that this detail may not always be available but for modern records there is really no reason why it should not be supplied. From time to time, records are submitted to the BMSFRD with the fungus name limited to just the genus, e.g. *Mycena* sp. Unless the record is supported by references to voucher 'herbarium' material and/or a good description and/or illustrations (photographs or paintings) so that a subsequent identification may be possible, then its value will be limited and in some circumstances it may not be added to the database.

Note that Field Numbers entered in the explanatory table below are for convenience of reference in the event of queries. They have no other significance and are not used in database entries. A few fields are for use by the Database Managers only. Where this applies the field numbers are entered in **bold** in the table.

Field Definitions

Field number	Field name	Length	Notes
1	Current Name	100	Current Name will be inserted/corrected by the Database Manager
2	Morph	15	Enter A for anamorph, T for teleomorph, H for holomorph or for spore stages of rusts: 0,I,II,III or IV
3	Associated Organism	50	as recorded – preferably a Latin name. Do not use 'sp.' as in 'Quercus sp.' – just enter 'Quercus'. Separate two or more associations with ' / '; primary association first
4	Accepted Associated Organism	50	edited version – primary association used on web site for speed of access
5	Substrate	50	the substrate on which the fungus was recorded - use lower case throughout
6	Ecosystem	50	see Appendix 3 - use lower case throughout
7	NCC Ecosystem code	10	see Appendix 3
8	Altitude (m)	4	if unknown leave blank – do not use '0' as this indicates sea level!
9	Day	2	in form 01, 02, etc. or - for not recorded

10	Month	2	in form 01, 02, etc. or - for not recorded
11	Year	4	19XX or 199X or 200X (do not use form '98' or '02')
12	Grid reference	10	single field – no spaces. Please use full reference, i.e. two letters and two, four, six or eight numbers
13	Country	50	England, Scotland, Wales, Northern Ireland, Irish Republic, Channel Isles, Scilly Isles, or British Isles
14	VC	4	Vice County Number (UK or Irish)
15	County Name	30	to allow generation of county lists. May differ from Watsonian Vice County
16	Locality	50	Where collected - preferably as named on OS map
17	Collector	50	in form 'B.M. Spooner' (no space between initials but a single space before the surname) or 'anon'. Only one name; if a group name is used it will be converted to 'anon'
18	Collector's Record Number	50	to hold any reference number allocated by the collector
19	Identifier	50	Same notes as for 17 above except that if a group name is used it will be converted to an agreed acronym
20	Confirmer	50	same notes as for 17 above
21	Current Referee	50	only used where material has been redetermined
22	Location of specimen	50	code for herbarium. If personal herbarium use form 'herb. B.M. Spooner'.
23	Herbarium number	25	accession number assigned by herbarium
24	Abundance	10	no standard values have been decided yet for this field
25	Doubtful record	1	either 'D' or '1' (default value for MycoRec users is '0'); usually only used by Database Managers. For an unsure identification use 'cf.' in the Name of Fungus field, e.g. if it could be Coprinus comatus but recorder is unsure, enter 'Coprinus cf. comatus'
26	Misidentification	1	Used in conjunction with 21 to indicate that the original determination was a misidentification
27	Foray record	1	enter 'F' if recorded at a BMS foray
28	Notes	255 or memo	free text of any nature
29	Identification Reference	255 or memo	literature used to make identification. MycoRec users have more than one field here but these are brought together on export
30	**BSM Link number**	8	link to Bibliography of Systematic Mycology database; used for published records
31	**BMSFRD record number**	8	unique record number – assigned by Database Manager
32	**Name of Fungus Record Number**	8	**Number used to uniquely identify a name of a fungus and its use**
33	**Current Name Record Number**	8	**Number used to uniquely identify a current name and its specific use**
34	Senders record code	50	**sender's record number/code (if used); automatically assigned for MycoRec/MycoTrack users**
35	Confidential	1	'Y' if record is to be treated as confidential
36	**Ownership**	1	used by Database Manager to indicate copyright status
37	**Update check**	1	Not in use
38	**Origin of record**	2	Entered by Database Manager to keep track of origin of major batches of records (e.g. from Local Recording Groups)
39	Name of Fungus	100	Name assigned by original recorder (edited only where there is a clear typographical error). Do not include here authors names, use notes field if they are required to fix usage of name (e.g. sensu Orton, 1960). For critical species it helps increase the importance of the record (in the absence of dried material) if the identification literature used is noted in 29 above.

Note: Field numbers and names entered in **bold** are for use by the Database Managers only.

Entering records in BMSFRD format

If you are creating a database, or extracting records from a database for submission to the BMSFRD, it helps to follow the column structure shown above but it is not essential. More critical is what is entered in each field and the notes alongside the fields above should be heeded. You do not need to follow the field length exactly. However, bear in mind that if you use fields longer than indicated your data may be truncated on import to the BMSFRD.

It is unhelpful if you combine any two or more fields into one of your own as they then have to be split and it is not usually easy to do this (e.g. Associated organism and Substrate). You may wish to have more fields in your 'home' database than those in the BMSFRD. One might, for instance, have a field for First Record, entering one character if it is a first for the Site, or a different character, or a further field, if it is a first for the County. These extra fields should be removed before submitting data to the BMSFRD.

'Current Name' will be the name recognised in the current British Checklist, but the recorder does not have to worry whether he/she is using the current name. Any correctly spelt synonym in use will be acceptable. The database program is able to recognise these and will automatically enter the 'Current Name'.

Locality

A consistent approach to the use of site names is recommended to make the database as user friendly and easily searchable as possible. Much confusion can be created if different recorders use completely different names for the same geographical site. This can be avoided if those individuals recording electronically for a recording group create a drop down database of site names to standardise this process. It is recommended that those recording fungi on an individual basis check with other local recorders that the site name they are using is the one in general use. If in doubt they should use the name, or nearest appropriate name, given on the most detailed OS map. If recorders are recording in some detail by field or forest compartment, then the largest name should be entered first e.g. 'Blencathra, field study centre, field 1' or 'Bentley Wood, compartment 4'.

The fields 'Associated organism', 'Substrate*' and 'Ecosystem'

It is anticipated that these fields will be used as keys to searches. It is important, therefore, that Latin names of trees and other plants should be used in the associated organism field and that there should not be a multiplicity of terms used to describe the same substrate or ecosystem, otherwise the database search may not find all the relevant records.

The Latin name should, where possible, be the full name - that is, the binomial comprising generic name and specific epithet. Where the species is not known just enter the genus (**not** the genus name followed by 'sp.' - this provides no additional information and causes sorting problems).

Where the genus itself is unknown, some attempt should be made at giving a higher name - for example in the case of a flowering plant, the family (e.g. Rosaceae). For grasses, use Poaceae; for ferns, Pteridopsida; for mosses, Musci; and for liverworts, Hepaticae. Recorders are not expected to be skilled botanists but for entries submitted to the BMSFRD some effort is required to give a correct Latin name for plants, even if only to class, order or family level.

*__Substratum__ is the correct scientific term. **Substrate** is more commonly used in conversation and in popular literature, and elsewhere in this document, but scientifically, 'substrate' refers to the chemical nature of the nutrient source rather than to the nature of the physical support.

Ecosystem descriptors

It is recommended that the interpretation given to the descriptors and qualifiers be that of the NCC Ecosystem Codes. Thus 'mixed woodland' should not be used as meaning a mixture of various broadleaf trees, or of broadleaf with one or two isolated conifers, but specifically a mix of broadleaf and conifer trees when either constitutes at least 10% of the canopy.

The term 'plantation' should be used for a woodland of obviously planted trees. The term 'parkland' can be applied to planted landscapes with tree cover less than about 30%, even though there is no associated mansion.

The amount of space available in the substrate or ecosystem fields is such that abbreviations should not be required when entering data in the fields designed to the latest BMSFRD format. If, however, abbreviations are entered some explanation should be passed on to the Database Co-ordinator. A list of NCC Ecosystem Codes is provided in Appendix 3.

Recommended terms and codes for the 'substrate' field

Substrate			Substrate qualifier
acorn	heartwood	stroma	acidic
aecidia	horn	stump	attached
agar plate	hyphae	telia	bare
anthers	inflorescence	thallus	buried
ascocarp	leaf	trunk	burnt
bark	litter	twig	calcareous
berry	log	uredinia	clayey
bole	manure	wallpaper	coniferous
branch	myxocarp	wood	contaminated
bread	needle	woodchips	cut
bud	paper		decorticate
burnt soil	peat		dead
cardboard	pellet		deciduous
carpet	petiole		dying
catkin	plant		effete
charcoal	plaster		fallen
clinker	pupa		herbaceous
compost	rachis		incubated
cone	resin		isolated ex
cupule	root		litter
driftwood	sand		live
dung	sawdust		mossy
feather	scum		rotten
foam	seeds		sandy
frond	skin		standing
fruit	soil		submerged
fruitbody	stem		wet
hay	straw		woody

The use of the 'substrate' terms is not mandatory but it is recommended that they be used wherever possible. Where relevant, the 'substrate' descriptor can be accompanied by more than one qualifier. Entries should always be in lower case.

Fungi on dung

Latin names of animals are not commonly known and there is no strict requirement for their use by those who record fungi on dung. English names are perfectly acceptable unless there is the possibility of ambiguity. The origin of the dung may not be critical to the identification of the fungus and the British Mycological Society *Keys to Fungi on Dung* by Mike Richardson and Roy Watling (see Appendix 1) uses general substrates such as dung, bird droppings, cast pellets, or decayed animal material.

Those who are enthusiasts for the great range of interesting fungi found on, or incubated from, animal droppings may, however, take great care to identify the source of the dung as this can be critical to identification in some cases. For those who wish to be specific a selection of Latin names of common animals is given below:

cattle	*Bos taurus*	rabbit	*Oryctolagus cuniculus*
fallow deer	*Dama dama*	red deer	*Cervus elaphus*
fox	*Vulpes vulpes*	roe deer	*Capreolus capreolus*
horse	*Equus caballus*	sheep	*Ovis aries*

Some examples of database field entries

Fungus found on	Associated with	Substrate	Ecosystem
Soil in frondose wood, tree unidentified broadleaf	Magnoliidae	bare soil	woodland
Litter under oak & larch in a mixed wood	*Quercus/Larix*	litter	mixed woodland
Indeterminate large stump in young spruce plantation		stump	spruce plantation
Fallen beech branch in mixed woodland	*Fagus sylvatica*	fallen branch	mixed woodland
Lawn in garden	Poaceae	soil	mown grassland
Indeterminate *Lactarius* in conifer copse	*Lactarius*	rotten fruitbody	conifer woodland
Moss growing by side of woodland path	*Musci*	live leaf	woodland
Fallen maple tree leaf in a park	*Acer campestre*	dead leaf	parkland
Dead stems of nettle on uncultivated land	*Urtica dioica*	dead stem	wasteland
Charred wood at bonfire site in a clearing in frondose wood	Magnoliidae	burnt wood	firesite clearing
Fallen *Pinus* cone in a mixed wood	*Pinus*	fallen cone	mixed woodland
Sheep dung in a pasture	*Ovis aries*	dung	grazed grassland

Note that ‘substrate’ and ecosystem fields should be entered using conversational English, as above. It is not necessary to use constructions like ‘leaf, living’ or ‘woodland, mixed’.

Doubtful identifications

Group recorders receiving records from beginners will suspect that some of the identifications are wrong. Do not include these records in data which is to be passed on, or do draw attention to the doubt by placing a question mark after the name (if the records are on sheets or forms). If using the BMSFRD format enter ‘D’ (doubtful) in the Doubtful Record field. This field is more likely to be used by the Database managers after querying data submitted. If you have an unsure identification attention may be drawn to it by inserting “cf.” between the generic name and specific epithet e.g. *Coprinus* cf. *comatus*.

MycoRec

MycoRec is a simple database package designed specifically for recording fungi, written by Jerry Cooper formerly of CABI Bioscience but now working for Landcare Research in New Zealand. It was produced non-commercially and is available free of charge to any mycologist interested in using it and submitting records to the BMSFRD.

The program can be used to submit data to, or to extract data from, the BMSFRD and it can produce a variety of reports. It requires Access 97 (or 2000) to operate but a free ‘run-time’ version is available for users who do not have this software. Note that it does not permit users to change BMSFRD data directly – all entries have to be submitted to the BMSFRD Database Co-ordinator or Database Manager in the required format and they will check and add all new or update entries. This is to ensure that the integrity of the BMSFRD is maintained.

MycoRec contains a check-list of current fungus names and synonyms; names of associated organisms, substrate and substrate qualifiers; ecosystem terms; an index of locations which can be constructed; lists and numbers of Watsonian vice-counties; an index and codes for herbaria, both personal and those in institutions; and an index of fungus identification literature can be constructed. MycoRec can be downloaded from the internet. Select MycoRec/MycoRec.htm from the BMS website (http://www.britmycolsoc.org.uk – see Appendix 10) and follow instructions for downloading and installing.

Alternatively, and possibly easier for the less experienced web user, it can be obtained on a CD from the Database Manager. To open the CD and install the program there is a simple sequence of operations to follow and you should request these written instructions on how to proceed. If at all possible, try to arrange for an experienced MycoRec or PC user to help with installation and to give a demonstration on how to use the program to submit data to the BMSFRD and to generate reports. A similar database system designed by Ernest Emmett (referred to as MycoTrak) is also used by some recorders. Further details are available from him at the postal address given in Appendix 6.

Recording using other programs

The relative merits of IBM-compatible (PCs) and Apple Macintosh computers have always provoked much debate. Formerly these systems were mutually antagonistic to the extent that data produced by one system could only be converted to be used on the other by an inconvenient and lengthy process. With current technology it is now much easier to exchange data between the two systems.

The most widely used machines follow the IBM standard. If buying new, with no special requirements in mind, it is probably better to acquire a computer of this type. The advantages in conformity, compatibility and (relatively) lower initial cost may outweigh other considerations.

The program used for recording can be one of several types. A Database program is specifically designed for the entering, manipulation and searching of records. A Spreadsheet program may, however, be used for the same purpose. It is not designed for data recording, but those who are very familiar with advanced spreadsheets can devise perfectly satisfactory methods of recording fungi. The BMSFRD Database Co-ordinator and Database Manager can accept data in this form, provided details of the record structure are supplied. As stated several times in this document, it is the keeping records that is important, not the specific method. If records are later to be exported to the BMSFRD it is a relatively straightforward process to modify the fields of the source database. If considering a transfer of data get in touch with the BMSFRD Database Co-ordinator for advice on how best to proceed.

Manuscript or typescript records

Except in the case of large and valuable historical records the BMSFRD manager would prefer these to be processed by local recording groups and sent in on disk. In special cases of converting batches of old manuscript records onto computer media it may be possible to get financial assistance from the BMS. If you are an individual or Group recorder not using a computer database to store your records you may wish to enter them on the Site Record Sheet (See Appendix 2).

It makes good sense to enter records according to site since all the records will share the greatest number of common field entries - this will make it possible to use a rapid method of entering these fields. The sheets should be photocopied before despatch in case of loss and then submitted to a third party willing to process them for you. The BMSFRD Database Co-ordinator is not in a position to accept data unless it has been entered into a computer and can be submitted electronically.

Sending records electronically

Send on diskette, CD, by e-mail or other form of electronic transfer, to the BMSFRD Database Co-ordinator. The data will be checked to ensure that they are compatible with the BMSFRD. They will also be checked for errors, and unusual records may be queried at this stage. The task of the Co-ordinator is to get the records into a form where the Database Manager can add them to the BMSFRD with the minimum of effort. Records can be based on the BMSFRD format or they may be on a personal database. If the latter, it is not necessary to include every column in the data extract, or even to keep them in the same order as the BMSFRD fields shown above.

For instance, a table in a personal database may have the fungus name as the first column rather than the last as in the BMSFRD, and it may lack several of the other columns. This is not a problem provided that records are submitted in a consistent structure. Otherwise it becomes almost impossible to import the data into the BMSFRD. It helps to have the column headers labelled with the appropriate name, especially if the table structure is different. Also the field lengths should not be greater than stipulated and if abbreviations have been used they should be the recommended ones.

To reduce the work to be done by others spelling should be carefully checked and typographical errors corrected, particularly in the fungus name. A good ‘manual’ way of doing

this is to sort the records in ascending alphabetical order and to view the records in a display format where each record occupies one line and there are up to 20 records on screen simultaneously. An aberrant entry will become much more apparent this way. Alternatively a page printout may reveal errors – for some reason they are much easier to spot in a printed document than on a computer screen. If MycoRec has been used spelling mistakes should not be a problem as the checklist it uses will ensure correct spelling of all fungus names and associated organism names. Particular care should be taken when entering essential fields e.g. the date, locality, grid reference, and the name of the recorder should be added so that entries can be queried. The program should be instructed to export (i.e. transfer electronically) in a database form acceptable to the recipient, whether this is done by e-mail or by sending a copy on a diskette or CD in the post. Most modern computer systems will accept data produced by a range of programs but is important for the recipient to know which program has been used. Where the program output is unsuitable for loading, the data can be exported to a file in various compatible formats.

If a large number of records is to be submitted they may exceed the capacity of a diskette. In this case it is possible to export to the hard disk and use a 'zip' program to compress the data onto one or more diskettes. Such a program is also available from the BMSFRD Database Manager. Alternatively it may be easier and less expensive to copy the records to a blank Compact Disk (CD) and send this through the post.

In practical terms, a single diskette, when zipped, provides a manageable amount of data (a few thousand records) to submit to the BMSFRD. Anything more than this and the task becomes rather daunting for the recipient. A list of full names corresponding to the initials used in the fields of Collector, Identifier and Confirmer should be enclosed, and any codes or initial letters that have been used to indicate books used for identification should be clarified, if these are not the usual ones.

Past records may not include all the information now required for the BMSFRD. They are very welcome, nevertheless. Although of less apparent value than a full record they may be important historically and they could reveal sites where rarities are still to be found today. They should, however, be entered into a computer file of some description, as this is the only practical way of transferring them to BMSFRD. When posting a diskette or CD it should be sandwiched between two stiff cards to avoid damage in the post. The recipient should be given the titles of the files indicating what they contain. Records can be sent on the Internet as e-mail attachments, preferably zipped to speed up transfer from a PC to the email service provider.

Saving and back-up

Files can be lost for inexplicable reasons – an accidental keystroke; a quite normal operation which quite suddenly refuses to operate; a power supply hiccup. Sometimes a screen will lock-up and nothing will release it. With some database programs hours of unsaved work can be lost so it is wise to save work every twenty minutes or so. Some programs can be asked to save work automatically at pre-determined time intervals. Back-up is a precaution against losing work already saved. If a virus or any other event damages a hard disk all the contents may be lost. Work which is valued in the long term should always be copied to a diskette or other media at frequent intervals. Such back-ups are stored and can then be used to replace data lost from a hard disk (when the problem causing the loss has been resolved). It is easy to fall into lax habits; most computer users have lost work at some time, or have heard of someone who has. Don't be complacent. There are two sorts of computer users: those who have lost a hard disk, and those who haven't lost one yet…….!

Viruses

Viruses are inserts into computer programs written by 'clever' people with mischief or malice in mind. They are circulated by the initiators and pass from computer to computer as data is transmitted from user to user by email attachments or other electronic means. Some add joke messages to the screen, others interfere with the operation of the hard drive, disrupting the contents and requiring expensive clean-up or replacement. Virus detection programs automatically scan all imports from floppy disks or e-mails. Anti-virus programs are not expensive and are simple to install, and most carry a free update facility for twelve months. After that time they can be further updated for a modest fee.

Update your anti-virus program regularly. New viruses are appearing all the time and the makers of anti-virus software are regularly catching up with them and offering protection against them. There are some obvious precautions. Purchasing second-hand software can be very risky unless from an impeccable source. Data on disks should never be accepted from other than well-known and trusted providers; and beware of e-mails with attachments from an unknown sender, the best course is to delete these immediately.

Making data available – intellectual property rights

The British Mycological Society has assembled a database of records of fungi occurring throughout the British Isles (the BMSFRD) and it is continuing to add to this database through its programme of forays, by encouraging local fungus recording groups, and by supporting fungus recording in many different ways. The Society believes that the records in the BMSFRD can play a vital role in our understanding of fungal biodiversity and conservation, in fungal taxonomy and in many other ways. All those who record fungi in Britain and Ireland are urged to contribute their records to this national database.

The Society's database managers have been the architects of the database. Starting with Dave Minter and currently Paul Kirk, and not forgetting the excellent work of Jerry Cooper, they have taken the records entrusted to the Society and made them into a very useful, important and accessible resource. The database is a national asset and it is a continuing priority for the Society that it should encompass all of the available records of British fungi. Since there are some groups of records that have not been entrusted specifically to the BMS, the BMSFRD has the facility to include sets of records from such other sources. These records can be either made available through the BMSFRD but organised elsewhere, or they can be managed and organised within the BMSFRD and made available as a distinct sub-set of records to their originators.

In general, however, the preferred approach is for recorders to grant the Society a licence to use their data. A copy of the licence form is attached as Appendix 11. A provider of records is still free to use and give to others his or her **own** records, since the Society has a licence to, but not an assignment of, the copyright. The database is only worthwhile if the records it contains are made available to those who can put them to good use for the furtherance of Mycology. It is therefore the aim of the Society to make these data easily and fully available with appropriate safeguards against misuse. Currently, this is mainly achieved by making the full data set (but with restrictions on what part of each record is included) available on the Internet via the Society's web site, http://www.britmycolsoc.org.uk (look under Resources), or try http://www.fieldmycology.net where it can be accessed more directly. It is intended to widen the amount of data made available in this way, so that the whole of each record is accessible.

There will still be the facility for those supplying data to ask for restrictions on certain records, whose disclosure would be inappropriate. There is a clear statement associated with such dissemination that records are copyright and subject to database rights. Users are therefore not free to copy the data or re-assemble them into other databases without the Society's permission. Where access via the internet is not convenient, the data set can be made available when appropriate in the form of a CD-Rom, subject to a signed confidentiality undertaking from the recipient.

Finally, it is necessary to distinguish the checklist, or fungal dictionary, from the set of records. A record is a factual observation about the occurrence of a fungus, along with the recorder's observations on what it was; it may also be based on a collection from one of the national herbaria or details from a published source. The checklist used in association with the BMSFRD is a list of currently accepted names, together with their relationship to earlier names. As such, although it derives in part from an interpretation of records, it is essentially a summary of current taxonomic opinion. Such a list needs to be open to scientific debate and maintained as far as possible as a single agreed compilation widely published and readily accessible to all. It is currently one of the checklists available in the NBN species dictionary (part of Recorder 2002).

BMS Library

The Society's library now comprises around 1000 items and is located at the Royal Botanic Gardens, Kew. It is for the use of all members and a catalogue can be obtained by downloading from the BMS website at

<http:// http://www.britmycolsoc.org.uk/resources.asp?Page=2&Cat=BMS%20LIBRARY>

or by post from the Librarian.

A BMS member may borrow two volumes at one time for a period of no longer than one month within which time books must be returned or renewed, otherwise the borrower could be liable for the cost of a replacement.

We ask that books be returned carriage paid and contributions to postage for the outward journey will be welcome, but there are no other charges.

If a personal visit is more appropriate, phone the Librarian, on 07991 521 401 to make arrangements. For security reasons the building in which the library is situated is kept locked so it is essential to phone first to ensure the Librarian is present.

Please send all offers, requests and correspondence to:

BMS Librarian, The Wolfson Wing, Jodrell Laboratory, Royal Botanic Gardens,
Kew, Richmond, Surrey TW9 3AB, UK.
E-mail: g.butterfill@rbgkew.org.uk

APPENDIX 1

Other relevant publications

Guide for the Beginner by Jack V.R. Marriott
Guide to Identification with a Microscope by Jack V.R. Marriott
Guide for the Kitchen Collector - Preservation and Cooking of Fungi by Dave Shorten
Downy Mildews, Powdery Mildews, Smuts and Rusts by Tom F. Preece
A checklist of the Rust Fungi of the British Isles by D.M. Henderson (2000)
Rust Fungi of the British Isles – guide to identification by their host plants by D.M. Henderson (2004)
A checklist of the Downy Mildews of the British Isles by T.F. Preece (2002)
Guide to the Literature for the Identification of British Basidiomycetes by Bert Brand, Alick Henrici and Patrick Leonard.
Keys to Fungi on Dung by M.J.Richardson and Roy Watling.

All the above are available while stocks last from the Librarian, British Mycological Society, The Wolfson Wing, Jodrell Laboratory, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB. Price lists and order forms can be downloaded from the BMS website.

BMS 'Keys' series Nos. 1 to 12 by various authors. For a list of contents and a note on how to obtain copies see Appendix 9.

Checklist of the British and Irish Basidiomycota by Nick Legon and Alick Henrici. Published by Royal Botanic Gardens, Kew. Available from **www.kewbooks.com** cost £29.00.

Field Mycology - a quarterly journal containing articles on the identification of fungi, including keys, top quality colour illustrations, news on current issues such as recording, taxonomy and conservation, plus reviews of literature and correspondence. Essential reading for all field mycologists. Obtainable by subscription (currently €29 [£20] p.a.) from Elsevier, Customer Service Dept., PO Box 211, 1000 AE Amsterdam, The Netherlands. Phone (+31) (20) 4853757. Email **nlinfo-f@elsevier.com** .

An Initial Guide to the Identification of Mushrooms and Toadstools by Paul Nichol. Published by the WEA and obtainable from Paul at WEA Office, Voluntary Sector Hub, Beaumont Fee, Lincoln LNI 1UW. Cost £3.50, plus 50p postage for single copies.

Poisonous Fungi by Mike Miner, obtainable from Dave Shorten, 45 Sevenfields, Highworth, Swindon, Wilts. SN6 7NF. Cost £2.00, plus 50p postage for single copies.

Recommended English names for fungi in the UK by Liz Holden. Published by Plantlife International. Obtainable from Plantlife Bookstore Summerfield Books, Main Street, Brough, Cumbria CA17 4AX. Cost £6 (incl. p & p).

The fungi name trail by Liz Holden and Kath Hamper. A key to commoner fungi aimed at beginners and children. Published by the Field Studies Council and obtainable from FSC Publications, Preston Montford, Montford Bridge, Shrewsbury, Shropshire SY4 1HW. Cost £3.25 plus £1 postage for single copies (discount available for orders of 10 or more).

NB. All prices quoted, including postage, are subject to change without notice.

APPENDIX 2

NOTE: The full size version of this record sheet can be downloaded from the BMS website in two formats: PDF (for hand-written completion) at http://www.britmycolsoc.org.uk/files/Record_Sheet.pdf, and as a Word.DOC (for word-processing) at http://www.britmycolsoc.org.uk/files/Record_Sheet.doc.

British Mycological Society

Foray Record Sheet – sites a-c

Recorder's name(s):

Site Name: (group records please) or use for separate habitats for same site

Site a (habitat a)

Site b (habitat b)

Site c (habitat c)

VC

Grid Ref (LL-nnnn)

Date (dd-mm-yy)

Altitude (m)

BMS Foray? Y/N

Site/ habitat	Fungus name	Lit. Ref. (see notes)	Morph	Medium/substrate	Associated organism Use international name if possible	Col.	Det.	Con.	Herb.

Notes: Please indicate the book or key used. Suitable abbreviations: BFF = British Fungus Flora; B&K = Breitenbach & Krantzlin; NM = Nordic Macromycetes; FAN = Flor.Ag.Neerland.; K&R = Kuhner & Romagn.; Mo = Moser; R&G = European Polypores; Corts. = Corticiaceae of N.Europe; Dn = Dennis; Bpuff. = British Puffballs, etc.; A&N = Antonin & Noordeloos; Ju. = Jülich; E&E = Ellis & Ellis; Court. = New Collins Field Guide; Bon = Bon's Field Guide; P = Phillips; etc.

Ot = other lit. ref., please cite here:

For Herbarium put yes if in personal herbarium, or K for Kew, E for Edinburgh, etc., explain code used if other:

APPENDIX 3

NCC ecosystem codes

General Category	Code	Specific Habitat	Notes
A Woodland & Scrub	A111	Broad-leaved semi-natural	
	A121	Coniferous semi-natural	
	A131	Mixed semi-natural	> 10% conifer/broad-leaved
	A112	Broad-leaved Plantation	
	A122	Coniferous plantation	
	A132	Mixed plantation	> 10% conifer/ broad-leaved
	A2	Scrub	
	A3	Parkland & scattered trees	
	A4	Recently felled woodland	
B Grassland & Marsh	B1	Acidic grassland	
	B2	Neutral grassland	
	B3	Calcareous grassland	
	B11	Acidic unimproved	
	B21	Neutral unimproved	
	B31	Calcareous unimproved	
	B12	Acidic semi-improved	
	B22	Neutral semi-improved	
	B32	Calcareous semi-improved	
	B4	Improved and/or re-seeded	
	B5	Marsh/marshy grassland	
C Tall Herb & Fern	C1	Bracken	
	C2	Upland species-rich vegetation	
	C3	Other tall herb & fern	
	C31	Tall ruderal	Vigorous perennials
	C32	Non-ruderal	Ferns, etc.
D Heathland	D1	Dry dwarf shrub heath	
	D2	Wet dwarf shrub heath	
	D3	Lichen/bryophyte heath	
	D4	Montane heath	
	D5	Dry heath/acid grassland mosaic	
	D6	Wet heath/acid grassland mosaic	
E Bog & Flush	E1	Bogs	
	E2	Flush & spring	
F Swamp & Fen	F1	Swamp & fen	
	F11	Single-species dominant swamp	
	F12	Tall fen vegetation	
	F2	Marginal & inundation	
	F21	Marginal vegetation	
	F22	Inundation communities	Inundation periodic

G Open Water	G1	Standing water	
	G2	Running water	
	G11	Eutrophic standing or running	Often discoloured by
	G21	water	algae, muddy substrate
	G12	Mesotrophic standing or running	As above but many
	G22	water	macrophytes present
	G13	Oligotrophic standing or	Usually clear with few
	G23	running water	macrophytes present
	G14	Dysotrophic standing or	Usually stained peat-
	G24	running water	brown
	G15	Marl standing or running water	Usually very clear
	G25		
	G16	Brackish standing or running	Coastal lagoons or
	G26	water	tidal channels
H Coastland	H6	Sand dune	
	H61	Fore dune	Usually low & unstable on foreshore
	H62	Yellow dune	More stable between fore & grey dunes
	H63	Grey dune	Stable ridges, usually fully vegetated
	H64	Dune slack	Hollows between dunes, often marshy
	H65	Dune grassland	Tall grass on consolidated dunes
	H66	Dune heath	Heath on consolidated dunes
	H67	Dune scrub	Scrub on consolidated dunes
	H84	Coastal grassland	Grassland with maritime species
	H85	Coastal heath	Heath with maritime species
I Rock Exposure & Waste	I	Exposed rock surfaces	May have mosses, lichens & ferns
J Miscellaneous	J1	Cultivated/disturbed land	
	J11	Arable	Fields, flowerbeds and ploughed land
	J12	Amenity grassland	Lawns, parks and playing fields
	J13	Ephemeral	Derelict urban sites, quarries etc.
	J14	Introduced shrub	Non-native shrubs, formal shrub beds
	J2	Boundaries	
	J21	Intact hedge	Stock-proof
	J22	Defunct hedge	With gaps, not stock-proof
	J24	Fence	Wooden
	J25	Wall	
	J3	Built-up areas	Urban habitats not already covered

APPENDIX 4

Table of Orders of Fungi

The list of orders of fungi in use in 2004, including lichenised fungi, is given below. Those interested in truffles should note that the old order Tuberales has been abandoned and two families of truffles are now in the Pezizales.

Acrasiales	Exobasidiales	Microascales	Rozellopsidales
Agaricales	Fistulinales	Monoblepharidales	Russulales
Amoebidiales	Ganodermatales	Mucorales	Saccharomycetales
Arthoniales	Glomales	Myxococcales	Saprolegniales
Atractiellales	Gomphales	Myzocytiopsidales	Schizophyllales
Auriculariales	Graphiolales	Neocallimastigales	Schizosaccharomycetales
Blastocladiales	Gyalectales	Nidulariales	Sclerodermatales
Boletales	Halosphaeriales	Olpidiopsidales	Septobasidiales
Botryobasidiales	Harpellales	Onygenales	Sordariales
Caliciales	Harpochytriales	Ophiostomatales	Spizellomycetales
Calosphaeriales	Helotiales	Ostropales	Sporidiales
Cantharellales	Hericiales	Patellariales	Stemonitales
Ceratiomyxales	Heterogastridiales	Peltigerales	Stereales
Ceratobasidiales	Hymenochaetales	Peronosporales	Taphrinales
Chytridiales	Hymenogastrales	Pertusariales	Teloschistales
Cortinariales	Hyphochytriales	Pezizales	Thelephorales
Dacrymycetales	Hypocreales	Phallales	Thraustochytriales
Diaporthales	Kickxellales	Phyllachorales	Tremellales
Diatrypales	Laboulbeniales	Physarales	Triblidiales
Dictyosteliales	Lachnocladiales	Plasmodiophorales	Trichiales
Dimargaritales	Lahmiales	Platygloeales	Trichosphaeriales
Dothideales	Lecanorales	Polyporales	Trichotheliales
Eccrinales	Leotiales	Poriales	Tulasnellales
Echinosteliales	Leptomitales	Protomycetales	Tulostomatales
Elaphomycetales	Liceales	Protosteliales	Uredinales
Endogonales	Lichinales	Pyrenulales	Ustilaginales
Entomophthorales	Lycoperdales	Pythiales	Verrucariales
Erysiphales	Melanogastrales	Rhipidiales	Xylariales
Eurotiales	Meliolales	Rhytismatales	Zoopagales

Major herbaria in UK and Europe

This list is from MycoRec but is by no means comprehensive and there are other institutional herbaria in the UK with significant collections of fungi. If you wish to refer to a herbarium not on this list please enter the name in the relevant field and BMSFRD will record under that name or will allocate a short code to it if necessary.

Name and location of herbarium	Reference code
CABI Bioscience, Egham	IMI
City of Birmingham Museums and Art Gallery, Natural History Dept.	BIRA
Leeds City Museum, Natural History Dept.	LES
Leicestershire Museums Service	LSR
Liverpool Museum, Botany Dept.	LIV
National Botanic Garden of Wales	NBGW
National Botanic Gardens, Glasnevin	DBN
National Museum & Galleries of Wales	NMW
Royal Botanic Garden, Edinburgh	E
Royal Botanic Gardens, Kew	K
The Natural History Museum, London	BM
University of Cambridge, Botany School	CGE
University of Oxford, Plant Sciences Dept.	OXF
University of Reading, Plant Sciences Laboratory	RNG
University of Sheffield, Dept. of Botany	SHD
Naturhistorisches Museum, Wien (Austria)	W
Rijksherbarium, Leiden (The Netherlands)	L

APPENDIX 6

Help with identification

This is the current list of individuals who have agreed to offer help with identification. Some of the people on the list have emphasised that they do NOT regard themselves as definitive experts and all they can do is to act as a 'filter', identifying the more common species but passing on to specialists any critical or difficult species. All are busy people so please do try hard to identify material yourself before sending it to them. The important points to remember are:

Send fresh material (unless noted to the contrary below). **Describe the material fully** (noting particularly smell, colour, texture - anything that is likely to change after collecting or drying). Ideally make a sketch or take a photograph of the fresh material and, if you possibly can, describe and draw microscopic characters (spores, cystidia etc.).

State the site where found, habitat and substrate for the specimen and also the books or keys used when trying (but failing) to identify it.

Phone, write or e-mail the relevant 'helper' from the list, to check that they are available and also whether they would prefer to receive material fresh or dried. Delicate specimens fare badly in the post, and boxes of rotting fungi on the door mat are a poor welcome home for someone who has been away for several weeks!

Pack the material carefully. Rigid cardboard boxes are usually best and fresh material should be wrapped in greaseproof paper or aluminium kitchen foil (not a polythene bag). Small specimens can be sent in the plastic containers used for photographic film and a small amount of moss may be helpful as packing material and to prevent drying out. Dried material can be sent in a sealed envelope but usually needs a surrounding box or padded envelope to avoid it being shattered. **Use first class post.**

Enclose with the specimens your description, site where found, etc. (as mentioned above) and also, if you want a written reply, a **self-addressed stamped envelope**. Send your e-mail address for a reply, if you have it; it is cheaper and faster.

List of volunteer helpers and the group or genus for which they can provide help:

Aphyllophorales (especially corticioids - if spores present!) ..... Alick Henrici
Ascomycetes (general) ..... Ted Blackwell
Boletes ..... Alan Hills or Geoffrey Kibby
Cyphelloids ..... Alick Henrici
Discomycetes ..... John Wheeley
Geoglossaceae ..... Alan Silverside or Brian Spooner
Heterobasidiomycetes ..... Peter Roberts
Hyphomycetes on plants and powdery mildews (Erysiphales) ..... David Farley [1]
Lichens ..... Anthony Fletcher
Myxomycetes, Erysiphales, *Exobasidium*, *Taphrina*, ... Bruce Ing
Rusts, smuts & downy mildews ..... Tom Preece [1]
Spine fungi (*Hericium* and stipitate hydnums) ..... Gordon Dickson [2]
Agaricus ..... Patrick Andrews or Geoffrey Kibby
Coprinus ..... Derek Schafer[3]

Cortinarius ..... Geoffrey Kibby
Hebeloma ..... Henry Beker [4]
Hygrocybe ..... Patrick Andrews
Inocybe ..... Alan Outen[5]
Lactarius ..... Patrick Leonard
Lepiota (incl. *Macrolepiota*, *Leucoagaricus*, *Cystolepiota*) ..... Richard Tofts
Mycena ..... Ernest Emmett
Panaeolus ..... David Antrobus
Psathyrella ..... Tom Hering
Russula ..... Geoffrey Kibby

[1] David Farley asks that material should be sent on named plant material if possible, or if leaves and flowers are included he may be able to identify the plant, but this cannot be guaranteed. The same comments apply to material sent to Tom Preece, who also asks that senders refer to relevant literature before submitting. (see Appendix 1)

[2] For spine fungi Gordon Dixon asks that, for terrestrial species, adjacent trees are noted as this can be helpful in identification and may widen our understanding of tree associations.

[3] For *Coprinus* Derek Schafer asks that only dried material is sent with several in a collection and including some with at least part of the gill edge intact (glistening white or hyaline).

[4] For *Hebeloma* Henry Beker asks that material is sent dried with a good macroscopic description and ideally with a photograph.

[5] For *Inocybe* Alan Outen asks that only fresh material in good condition is sent, in crush-proof boxes, and that packages are marked “Mycological material, please rush”.

NB. Personal telephone numbers and/or email addresses are not included in the following table. It is suggested that you note the groups or genera in which you have a special interest and obtain the telephone number of the relevant person by writing in the first instance.

Dr P. Andrews	Foxbury, Marston Lane, Frome, Somerset BA11 4DG
Dr D.J. Antrobus	55 Gower Road, Halesowen, West Midlands B62 9BX
Prof. H. Beker	Rue Père de Deken 19, 1040 Bruxelles, Belgium
Mr E. Blackwell	7 Ashley Walk, Orleton, Ludlow, Shropshire SY8 4HD
Mr G.C. Dickson	Flagstones, 72 Catisfield Lane, Fareham, Hants. PO15 5NS
Mr E.E.Emmett	Drumlins, Newtonmore Road, Kingussie, Inverness-shire PH21 1HD
Dr D.B. Farley	School of Biological Sciences, Washington-Singer Labs, University of Exeter, Perry Road, Exeter EX4 4QG
Dr A. Fletcher	Leicestershire Museums Service, Collections Resources Centre, 50 Hayhill Industrial Estate, Sileby Road, Barrow on Soar, Leics LE12 8LD
Mr A. Henrici	8 Victoria Cottages, Sandycombe Road, Richmond, Surrey TW9 3NW
Dr T.F. Hering	33 Langley Drive, Kegworth, Derby DE74 2DN
Mr A.E. Hills	16 Acremead Road, Wheatley, Oxford, Oxon. OX33 1NZ
Prof. B. Ing	24 Avon Court, Mold, Flintshire CH7 1JP
Mr G. Kibby	British Mycological Society, Wolfson Wing, Jodrell Laboratory, Royal Botanic Gardens, Kew, Surrey TW9 3AB
Mr P.L. Leonard	Greensands, Farnham Lane, Haslemere, Surrey GU27 1HD

Mr A.J. Outen	14 Fairfax Close, Clifton, Shefford, Bedfordshire SG17 5RH
Dr T.F. Preece	Kinton, Turners Lane, Llynclys Hill, nr Oswestry, Shropshire SY10 8LL
Mr P. Roberts	Mycology Section, Royal Botanic Gardens, Kew, Surrey TW9 3AB
Dr D.J. Schafer	8 Hawleys Lane, Whitchurch, Bucks. HP22 4LB
Dr A.J. Silverside	Dept. of Biology, University of Paisley, Paisley, Renfrewshire PA1 2BE
Dr B.M. Spooner	Mycology Section, Royal Botanic Gardens, Kew, Surrey TW9 3AB
Mr R. Tofts	Stonewell Cottage, 2 The Paddocks, Church Street, Meysey Hampton, Nr. Cirencester, Glos. GL7 5JX
Mr J. Wheeley	17 Harts Leap Road, Sandhurst, Berkshire GU47 8EW

BMS Membership

The British Mycological Society is a Learned Society and registered charity with the constitutional aim to promote mycology. Membership is open, subject to election, to anyone interested in mycology. A variety of membership categories exist including: Member (inclusive or exclusive of subscribing to Mycological Research), Associate, Postgraduate and Undergraduate Members. A membership application form can be obtained from the BMS website at:

http://www.britmycolsoc.org.uk/files/webapplication_page.pdf

or from the Membership Secretary (address given below), to whom the completed form is returned. No payment is required with this initial application.

All completed applications returned are considered by the Membership Secretary and two other senior BMS Officers, and acceptable candidates are recommended for election at the next available meeting of Council. After initial membership ratification, you will be sent the Society's Constitution and Bye Laws, as well as a Subscription Payment Form to complete and return with payment. Upon receipt of this payment, your Society journals will be dispatched to you. Membership runs from 1st January annually, and applications received after 31st October will be processed to begin the following year.

All enquiries about membership matters should be addressed to the Membership Secretary:

Dr Julian Mitchell, School of Biological Sciences, University of Portsmouth,
King Henry Building, King Henry 1 Street, Portsmouth PO1 2DY
(E-mail. julian.mitchell@port.ac.uk)

APPENDIX 7

Useful contacts

BMS Recording Network Co-ordinator
Liz Holden, Allanaquoich, Mar Lodge, Braemar, Ballater, Aberdeen AB35 5YJ
Email: liz@marmycology.co.uk

BMS Conservation Secretary
Shelley Evans, Icknield House, 8 Saxonhurst, Downton, Salisbury, Wilts. SP5 3JN
Email: shelley-evans@myco-services.freeserve.co.uk

BMS Database Manager
Paul Kirk, CABI Bioscience, Bakeham Lane, Egham, Surrey TW20 9TY
Email: pkirk@cabi.org

BMS Database Co-ordinator
John Wheeley, 17 Harts Leap Road, Sandhurst, Berks. GU47 8EW
Email: john.wheeley@xansa.com

Field Mycology Editor
Geoffrey Kibby, British Mycological Society, The Wolfson Wing, Jodrell Laboratory, Royal Botanic Gardens, Kew, Surrey. TW9 3AB

For submission of herbarium material:
British Mycological Society, Mycology Section, Royal Botanic Gardens, Kew, Surrey TW9 3AB
Email: mycology@rbgkew.org.uk

For help with computing:

Advice on computing generally, including for Apple Macintosh users:
Malcolm Storey, 43 Berry's Road, Upper Bucklebury Road, Reading RG7 6QL
Email: malcolm.storey@dsl.pipex.com

Advice on computing generally, word processing and databases other than MS Access:
Alan Braddock, 6 Westfield Terrace, Horbury, West Yorkshire WF4 6HY
Email: braddem@which.net

APPENDIX 8

Fungus Recording Groups June 2006

BUCKINGHAMSHIRE FUNGUS GROUP
Derek Schafer, 8 Hawleys Lane, Whitchurch, Bucks. HP22 4LB

COTSWOLD FUNGUS GROUP
Dave Shorten, 45 Sevenfields, Highworth, Swindon, Wilts. SN6 7NF

DEAN FUNGUS GROUP
Valerie Davies, Treveth, Wintles Hill, Westbury on Severn, Glos. GL14 1QB

DEVON FUNGUS GROUP
David Farley, School of Biological Sciences, Washington Singer Labs, Perry Road,
University of Exeter, Devon EX4 4QG.

DORSET FUNGUS GROUP
Ken Roberts, 6 Woodlinken Close, Verwood, Dorset BH31 6BS

DUBLIN FUNGUS GROUP
Howard Fox, National Botanic Gardens, Glasnevin, Dublin 9

ESSEX FUNGUS GROUP
Tony Boniface, 40 Pentland Avenue, Chelmsford, Essex CM1 4AZ

FIFE FUNGUS INTEREST GROUP
Keith Cohen, 79, Cash Feus, Strathmiglo, Cupar, Fife, Scotland KY14 7QP

FUNGUS GROUP OF S.E. SCOTLAND
Elizabeth Farquarharson, 6 Chamberlain Road, Edinburgh EH10 4DN

FUNGUS SURVEY OF OXFORDSHIRE
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GLAMORGAN FUNGUS GROUP
Mervyn Howells, 63 Ashleigh Road, Sketty, Swansea, Glam. Wales SA2 8EE

GRAMPIAN FUNGUS GROUP
Liz Holden, Allanaquoich, Mar Lodge, Braemar, Ballater, Aberdeen, Scotland AB35 5YJ

GWENT FUNGUS GROUP
Sheila Spence, 'Porcini', 12 Golding Way, Ledbury, Hereford, HR8 2PN

HAMPSHIRE FUNGUS RECORDING GROUP
Stuart Skeates, 55, Cherville St., Romsey, Hampshire SO51 8FB

HEREFORDSHIRE FUNGUS SURVEY GROUP
Sheila Spence, Porcini, 12 Golding Way, Ledbury, Hereford HR8 2PN

HERTFORDSHIRE FUNGUS GROUP
Alan Outen, 14 Fairfax Close, Clifton, Shefford, Beds. SG17 5RH

HUNTINGDON FUNGUS GROUP
Sheila Wells, Meadowbrook, 94 High Street, Upwood, Huntingdon, Cambs. PE26 2QE

LEICESTERSHIRE FUNGI STUDY GROUP
Richard Iliffe, 17 Island Close, Hinckley, Leics. LE10 1LN

LINCOLNSHIRE NATURALISTS UNION - MYCOLOGICAL SECTION
Ken Rowland, 2 Dene Close, Skellingthorpe, Lincoln. LN6 5SU

LONDON RECORDING GROUP
Andy Overall, 'Fungi to be with', Flat 2, 39 Northend Road, Golders Green, London NW11 7RJ

MELBOURN MUSHROOM CLUB (Cambridge area)
Helene Davies, Culver Cottage, 139 Hillcrest, Bar Hill, Cambridge CB3 8TH

MID YORKSHIRE FUNGUS GROUP
Anne Bowers, 6 Ashwood Terrace, Leeds LS6 2EH

MYCOLOGY SECTION SOCIETE JERSIAISE
Nick Armstrong (Secretary), 2 Hillside, La Ruelle, Vacluse, St Helier, Jersey JR3 3JD

NORFOLK FUNGUS STUDY GROUP
Tony Leech, 3 Eccles Road, Holt, Norfolk NR25 6HJ

NORTH EAST FUNGUS GROUP
Alan Legg, 36 Carleton Drive, Darlington, Co. Durham DL3 9QP

NORTH SOMERSET & BRISTOL FUNGUS GROUP
Roy Betts, 1 Kings Road, Portishead, North Somerset, BS20 8HH

NORTH WEST FUNGUS GROUP
Dr. Irene Ridge, Smalley's Farm, Billington, Clitheroe BB7 9JF

NORTHERN IRELAND FUNGUS GROUP
Gerald Shannon, 41A Newal Road, Ballymoney, Co. Antrim, N. Ireland BT53 6HB

NOTTINGHAMSHIRE FUNGUS GROUP
Mary Hawkins, 16 Gertrude Rd., West Bridgford, Nottingham NG2 5BY

PEMBROKESHIRE FUNGUS RECORDING NETWORK
David Harries, Somerton Cottage, Hundleton, Pembroke, Pembs. SA71 5RX

SALISBURY NATURAL HISTORY SOCIETY (MYCOLOGY SECTION)
Edward Gange, 'Belvedere', Southampton Road, Whaddon, Salisbury, Wilts. SP5 3DZ

SHROPSHIRE FUNGUS GROUP
Roy Mantle, 37 Ludlow Rd., Bridgnorth, Shropshire WV1 6SH

STAFFORDSHIRE FUNGUS GROUP
Camilla Lovatt, Dunwood Hall, Longsdon, Nr Leek, Stoke-on-Trent, Staffs. ST9 9AR

THAMES VALLEY FUNGUS GROUP
Gordon Crutchfield, 5 Highdown Hill Road, Emmergreen, Reading RG4 8QR

WARWICKSHIRE FUNGUS SURVEY
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WEST WEALD FUNGUS RECORDING GROUP
Barry Hughes, Woodbury Knoll, 5, Hambledon Park, Hambledon, Godalming, Surrey GU8 4ER

WORCESTERSHIRE FUNGUS GROUP
Diana and Tim Bateman, Baytree Cottage, Uphampton, Ombersley, Worcs. WR9 0JS

APPENDIX 9

BMS KEYS - list of contents

KEYS 1 - List of keys for agarics with medium brown spores
Keys to the species in the *Collybia dryophila* group

KEYS 2 - Keys to the British Clavarioid Fungi: *Clavulina* and *Clavulinopsis*

KEYS 3 - List of Keys for agarics with pink spores
A preliminary list of British Heterobasidiomycetes, British polypores
Supplement to Keys to *Collybia dryophila* group

KEYS 4 - Keys to the species of *Clavaria*
Keys to the species of *Ramaria*

KEYS 5 - A list of British Aphyllophoroid fungi

KEYS 6 - Provisional Key to British species of *Tephrocybe* found on burnt ground
Key to British *Typhula* and other species
British Heterobasidiomycetes: additions, corrections and further notes

KEYS 7 - Some problem Tricholomas
Tricholoma albobrunneum
Analysis of some spore length distributions
Some hints for identifying wood in the field

KEYS 8 - Keys to *Naucoria* species of damp ground
Notes of British fungi on burnt ground, charcoal, charred vegetation etc.

KEYS 9 - The etymology of British fungus names – *Lactarius* and *Russula*
Uncommon fungi – *Naucoria amarescens*
Key to British *Clavariadelphus* species
Key to British *Ramariopsis* species

KEYS 10 - Alphabetical list of British Myxomycete species

KEYS 11 - Keys to the British species of *Lactarius*

KEYS 12 - Keys to British species of *Amanita* and *Limacella*
A *Collybia* quick key
Keys to *Galerina* species

QUICK KEYS: *Hygrocybe*; *Amanita* and *Limacella*; *Collybia*

Keys can be obtained by application to Archie McAdam, Silverdale, Raikeswood Crescent, Skipton, Yorkshire BD23 1ND. They are supplied at the cost of photocopying plus postage. For more details send a SAE plus an extra first class stamp.

APPENDIX 10

The BMS websites – a message from the Webmaster

The website of the British Mycological Society is at http://www.britmycolsoc.org.uk. The website is primarily a Society website, which aims to provide a service to members in as many ways as possible. On the site you will find information about all aspects of BMS activities and hundreds of other links to other Internet sites and other items of interest (including links to copies of all BMS documents and application forms).

When you first arrive at the home page you will see a cross-section of a fungal hypha in the middle and a list of hyperlinks to "Departments" on the right hand side of this. These links take you to pages of information about the major administrative areas, like Membership, Meetings and Forays, Publications, Education, and so on. Nestled in amongst these links is one called "Resources" and THAT'S where we keep the best stuff! You will find here a link to Databases, Directories and Keys that will provide access to the BMS Fungal Records Database and a great deal more. There are more than 600 hyperlinks in the Resources part of the site, so it's well worth surfing around to get to know it.

We'd particularly like to highlight the BMS shopping Mall (within the Resources area). Use the Shopping Mall and you bring money into mycology because the Society receives commission from the retailers; and we have this sort of arrangement with some top High Street stores. The way it works is that you use your mouse to "click through" from the BMS Shopping Mall (and it IS IMPORTANT that you start the process from the BMS website) to a retailer's website and the two computers exchange information. A fraction of what you spend is paid to the Society (as a "thank-you" for bringing the customer and retailer together). It's only a small fraction, typically around 3%, but if you made all your Tesco Internet purchases this way, and maybe bought all your Amazon books and CDs too, then you could easily generate £10 or £20 commission in a year. And if all 2000 members of the Society did just that each year (and encouraged their friends to go Internet shopping via the BMS Shopping Mall too) – well, you can work it out for yourself, but obviously, Society funds could benefit significantly. As Society funds are spent on Society activities, we will be able to sponsor more mycology and you will eventually benefit from a wider range of cheaper activities.

The final message is: surf around the BMS website to find out what your website has to offer YOU. If you think of something that we should cover, but you can't find, then contact the webmaster and complain – his email address is on every page!

January 2006 saw the launch of the Society's education website at http://www.fungi4schools.org/, published as part of our attempts to compensate for the deficiencies in UK school education. Teaching of biology in schools in the United Kingdom emphasises comparison of plants and animals – the GCSE Science National Curriculum specification doesn't mention fungi. During the past few years we have contributed a 'Funky Fungus' workshop to several Summer Schools and Science Week events aimed at school pupils in years 8 to 11 and at some point early in the proceedings we ask the question "Are fungi animals, plants, bacteria, or something different from all of these?" The overwhelming majority of these pupils reply that fungi are bacteria. Clearly, something is seriously lacking in our educational system if so many children can end their statutory education at age 16 knowing next to nothing about the fungi that make up the largest kingdom of higher, eukaryotic, organisms.

Teachers are willing to include fungi in the curriculum if given the tools and the guidance to do so and this is the purpose of **fungi4schools**. The website provides an extensive (but still growing) range of free resources starting with primary and beginners level and extending to the post-16 'close to research' level.

The resources include free to download reprints of articles published in *Mycologist* and *Field Mycology*, example lessons, teachers' guides, pupil class sheets, questionnaires and quizzes and games and puzzles. A range of topics is covered from cell structure and function, through biochemistry to health topics and plant growth and disease. Look at this website; use the resources for your own purposes; **suggest (preferably, write) new ideas for it**; bring it to the attention of schools and teachers you know. Spread the word!

David Moore (BMS Webmaster)

April 2006

APPENDIX 11

Copyright licence form

LICENCE UNDER COPYRIGHT AND RELATED RIGHTS

I, (*Name*)..... being a provider of records of fungi either as a collector, an individual recorder, a recorder for a group or a compiler of records in database form, or some combination of these, in consideration of having my records included in the British Mycological Society's database, do hereby give licence to the British Mycological Society in respect of all records previously sent or to be sent from this day on and in which I own or have a licence to the copyright or to any database compilation right or to any other rights in the records to incorporate such records in the Society's database.

I waive my moral rights to the records.

I hereby give permission for my name, if included as a part of any record submitted to the Society, to be included in such records and to be made known to others for the purpose of operating the database. I acknowledge that such information may be "personal data" as defined in the Data Protection Act.

I agree that the Society may make use of the records in any way fit for its purposes including the supply to outside agencies or other third parties, some of which may make the data public. I consent to and give licence to such use and acknowledge that such information may be made publicly available on electronic networks or in other ways in the UK and beyond.

I confirm that I am entitled to grant the above rights and licences and that if my employer or other third party has any rights in such records then I have secured all necessary approvals to grant the said rights and licences.

This Agreement shall continue until I give written notice of termination to the British Mycological Society's Database Manager but the rights and licences hereby granted prior to such notice of termination shall continue.

Signed:

……..

Date: ……...

Address:

……..

……..

……..

APPENDIX 12

Guidelines for field mycologists: the practical interpretation of Section 21 of the Drugs Act 2005

This document has been prepared in consultation with the Home Office Drugs Branch Licensing Section and with reference to Home Office Circular 36 / 2005. Whilst the Home Office is happy that these guidelines are satisfactory from a legislative point of view, it should be noted that only the courts can give an authoritative view. Field mycologists, in following these guidelines, are acting lawfully and do not require a licence in so doing.

Overview:
Section 21 of the Drugs Act 2005 amends the Misuse of Drugs Act 1971 to provide that all psilocybe magic mushrooms[1], regardless of whether they constitute a preparation or a product, constitute a Class A drug. This was achieved by inserting

'Fungus (of any kind) which contains psilocin or an ester of psilocin'

into Part 1 of Schedule 2 to the 1971 Act.

Thus, as of 18th July 2005, it is an offence to import, export, produce, supply, possess or possess with intent to supply magic mushrooms whatever form they are in, whether prepared or fresh.

Exceptions:

- A person will not be committing an offence of possession of magic mushrooms if the mushrooms are growing uncultivated on his or her premises.
- A person will not be committing an offence of possession if he or she picks magic mushrooms for disposal (i.e. destruction OR delivery to a person who can lawfully take custody of them, e.g. licensed staff at the Royal Botanic Gardens, Kew and Edinburgh) as soon as is reasonably practicable and holds them in accordance with that purpose.

Licence provision:
The Secretary of State can issue a licence in respect of the production, supply, offer to supply or possession of psilocybe fungi – normally for research purposes rather than for general use.

Such a licence is issued annually and currently costs £31.00 p.a. Applications would be made to:

Ian Breadmore or Mike Evans
The Home Office Drugs Branch Licensing Section
Floor 6, Peel Building
2, Marsham Street, London SW1P 4DF

[1] The phrase 'magic mushroom' refers to all those species listed in Appendix 12A (below). This is a provisional list prepared by the Royal Botanic Garden, Kew: it reflects current knowledge only and revisions will need to be made as that knowledge expands.

The law and field mycology:

- If the fungi are growing uncultivated on your lawn or field, you are not considered to be in possession of a Class A drug.

- Be aware of the fungi listed in Appendix 12A (below).

- If you knowingly collect a fungus listed in Appendix 12A, e.g. *Psilocybe semilanceata* or *Hygrocybe psittacina*, you potentially commit an offence of possession. If field identification is possible then it is, of course, unlikely that you would need to take the fungus home for further identification.

- If you do not know what the fungus is and have no reason to suspect that it is a controlled drug then it is lawful to collect it and hold it for identification. If it proves to be a species known to contain psilocin or esters of psilocin then it should either be destroyed or forwarded (as soon as possible) to a person who is lawfully able to hold the material. It is important to label material correctly. The label should give the usual information recorded with herbarium specimens (name given to fungus / text used to ID / when / where / who collected it etc.) but with the addition of a statement about the future of the specimen, e.g. 'Specimen to be forwarded to Royal Botanic Garden, Kew for retention in herbarium'.

- If you have collections of the fungi listed in Appendix 12A already in your herbarium then you should destroy the collections or forward them to the custody of a person lawfully able to hold the material.

- You may wish to continue to hold Appendix 12A listed fungi as a part of your personal herbarium reference collection. However, an application for an individual licence for this purpose is likely to fail.

Further Information:
The Drugs Act 2005 can be found at this URL: http://www.opsi.gov.uk/acts.htm

The Misuse of Drugs (Amendment) (No. 2) Regulations 2005 and the Misuse of Drugs (Designation)(Amendment) Order 2005 can be found at: http://www.hmso.gov.uk/stat.htm

The 2005 Regulations and Order are published by The Stationery Office. Telephone orders / general enquiries 0870 600 5522 or online at: http://www.tso.co.uk/bookshop.

Background and further detail

The following text explains the background to the 2005 amendment of the legislation and gives further detail with regard to exceptions.

Previously existing legislation:
The Misuse of Drugs Act 1971: this Act controlled the chemicals inside the mushrooms as a Class A drug rather than the mushrooms themselves. Magic mushrooms were only classified as a Class A drug under that Act if they constituted a preparation or a product containing psilocin or an ester of psilocin. It is a matter of legal interpretation what constitutes a preparation or a product and this had led to uncertainty.

Why amendment to the 1971 Act was considered necessary:
Magic mushrooms are a powerful hallucinogen and can cause real harm, especially to vulnerable people and those with mental health problems. Estimates indicated that over 400 establishments in this country had been supplying magic mushrooms (mostly imported). The very substantial increase in the commercial sale of magic mushrooms in the UK raised concerns regarding public health, which the Government is fully entitled to address.

The amended legislation:
Section 21 of the Drugs Act 2005: amends the 1971 Act to provide that all psilocybe magic mushrooms, regardless of whether they constitute a preparation or a product, constitute a Class A drug. This was achieved by inserting

'Fungus (of any kind) which contains psilocin or an ester of psilocin'

into Part 1 of Schedule 2 to the 1971 Act. It came into force on 18th July 2005.

It is therefore an offence to import, export, produce, supply, possess or possess with intent to supply magic mushrooms whatever form they are in, whether prepared or fresh.

When is it not unlawful to possess magic mushrooms?
The Misuse of Drugs (Amendment) (No. 2) Regulations 2005 (the 2005 Regulations) outline four situations when it is not unlawful to possess magic mushrooms**.**

Regulation 2(2) inserts a new regulation 4A (Exceptions for drugs in Schedule 1) into the Misuse of Drugs Regulations 2001 (the 2001 Regulations) to ensure that magic mushrooms are excepted from the offence of possession under section 5(1) of the Misuse of Drugs Act 1971:

(i) where the magic mushrooms are growing uncultivated. This ensures that persons who have magic mushrooms growing on their land uncultivated will not be acting unlawfully by possessing them in this way. (Should those persons intend to supply those magic mushrooms they will, however, be committing an offence of possession with intent to supply controlled drugs);

(ii) where the magic mushrooms are picked by a person, who possesses them lawfully (for example, because they are growing uncultivated on premises they own or occupy) in order to deliver them as soon as is reasonably practicable into the custody of a person lawfully entitled to take custody of them and they remain in that person's possession for and in accordance with that objective;

(iii) where the magic mushrooms are picked in order to either destroy them as soon as is reasonably practicable (purpose of destruction) or deliver them as soon as is reasonably practicable to a person (including a police officer) lawfully entitled to take custody of them (for purposes of delivery) and are then held, whether by the person who picked them or by another person, for and in accordance with the purpose of destruction; and

(iv) where the magic mushrooms are picked in order to destroy them as soon as is reasonable practicable (purpose of destruction) and then held, whether by the person who picked them or by another person, for and in accordance with the purpose of delivering them as soon as is reasonably practicable to a person lawfully entitled to take custody of them (purpose of delivery).

In addition to the above four scenarios, section 5(4)(b) of the 1971 Act already provides a defence to the offence of possession of a controlled drug where a person shows that they took possession of that drug for the purpose of delivering it into the custody of a person lawfully entitled to take custody of it

and that as soon as possible after taking possession of it they took all such steps as were reasonably open to them to deliver it into the custody of such a person.

Effectively, thus far, any person can pick magic mushrooms for either the purpose of delivery or destruction, or acquire magic mushrooms for such purposes, so long as he holds them for and in accordance with either of those purposes.

There is also a defence in section 5(4)(a) of the 1971 Act for those who, having such fungi in their possession, can prove that that they took possession of the mushrooms (knowing or suspecting the fungi to be a controlled drug) for the purpose of preventing others from committing or continuing to commit an offence in connection with the fungi and that as soon as possible after taking possession of the fungi they had taken all such steps as were reasonably open to them to destroy the fungi or to deliver them into the custody of a person lawfully entitled to take custody of them.

Proof of lack of knowledge is also a defence to the offences of production, supply, possession and possession with intent to supply magic mushrooms under section 28 of the 1971 Act. Section 28 would apply, for example, where a person who picks magic mushrooms in the wild does not know or suspect and has no reason to suspect that they are magic mushrooms.

Licensing provision:
Regulation 2(3) of the 2005 Regulations inserts a fungus containing psilocin or an ester of psilocin into Schedule 1 to the 2001 Regulations, enabling the Secretary of State to issue a licence under regulation 5 of the 2001 Regulations in respect of the production, supply, offer to supply or possession of those fungi – normally for research purposes rather than for general use.

Liz Holden
BMSRN Co-ordinator

March 7th 2006

APPENDIX 12A

Preliminary list of British Fungi reported to contain psilocybin/psilocin.
N.B. This list may be incomplete and should be treated as provisional.
Based on: Rätsch, A. (2005). *The Encyclopedia of Psychoactive Plants. Ethnopharmacology and it Applications*. Park Street Press.

Confirmed
Conocybe cyanopus
Conocybe velutipes (= *kuehneriana*)
[*Galerina steglichii* hothouse alien]
Gymopilus junonius
Gymnopilus liquiritiae
[*Gymnopilus purpuratus* hothouse alien]
Inocybe corydalina
Inocybe haemacta
Panaeolina foenisecii
Panaeolus acuminatus
Panaeolus fimicola
Panaeolus olivaceus
Panaeolus papilionaceus
Panaeolus subbalteatus
Pluteus salicinus
Psilocybe coprophila
Psilocybe crobula
Psilocybe cyanescens
Psilocybe inquilina
Psilocybe merdaria
Psilocybe montana (incl. *physaloides*)
Psilocybe semilanceata
Psilocybe strictipes
[*Psilocybe stuntzii* hothouse alien]
Stropharia aeruginosa
Stropharia caerulea / *cyanea*
Stropharia percevalii
Stropharia pseudocyanea
Stropharia semiglobata
Stropharia squamosa
Stropharia thrausta

Possible but not confirmed
Hygrocybe psittacina
Mycena amicta
Panaeolus semiovatus
Pluteus cervinus
Pluteus ephebeus (= *villosus/pearsonii*)
Psathyrella candolleana
Rickenella fibula
Rickenella swartzii
Stropharia coronilla

Brian Spooner August 2005