

Linnean Society

Report on the Taxonomy & Systematics Plenary Meeting 11th September 2014

“Who Needs Taxonomists?”

Overview

This meeting, attended by some 70 delegates, brought together the ‘users’ of taxonomic data and those generating and interpreting the data on biodiversity. It provided an opportunity for industry and other users to articulate their current and future needs.

The 1-day programme (see appendix, which includes abstracts) comprised a series of perspectives, including those from industry, government/agencies, NGOs, vets/medics, horticulturists, trainers and taxonomists. The overall goal was to bring together and improve connectivity between users of taxonomic data and identifiers/taxonomists, highlighting the value of these experts, which will support the case for funding research and teaching in the taxonomy arena to ensure a continuing supply of appropriately trained experts to inform both industry and government alike with respect to describing and sustaining biodiversity.

Speakers included representatives from the main bodies that fund taxonomy research in the UK, namely DEFRA and RCUK (BBSRC and NERC). The final session of the day involved an open discussion, which focused on aspects of funding. The details of this discussion are also appended, while the key points and actions to emerge from the day are listed below:

Funding

- There is no ring-fenced funding for taxonomy nor is there any one body taking a strategic overview of funding in taxonomy (no more Co-Sys or SYNTAX; this is unlikely to change in future, in the UK at least). Current funding for taxonomy comes from a plethora of sources – inside and outside the UK.
- Taxonomists must highlight the commercial value of their project proposals in any grant applications. See BBSRC view in discussion below for examples. However, it was pointed out that it does not necessarily help business to know that there are more species: there is no cost to the business community to allow ignorance levels to remain i.e. there is no cost to leaving the world taxonomically ignorant, leaving ignorance unaddressed – so making the business case is not straightforward.
- Proposals should be collaborative, with a taxonomic component (‘pure’ taxonomy is less attractive to funders, unless ‘value’ can be demonstrated). Proposals need to have goals presented using current ‘jargon’ and have some focus on novel approaches or wealth creation outputs.
- NERC has started to progress a new mechanism/process for feeding in worthy areas of research, looking at this twice a year, with fast turnaround, so think creatively and feed into this process.

Training

- There is serious concern that there may be fewer taxonomists, with many vital specialisms under-represented, as many of the current generation are retiring without being replaced. This is being exacerbated by the fact that the field of taxonomy appears unappealing to students (lack of awareness of potential job opportunities), so fewer people are pursuing taxonomy at the tertiary level. The same applies to curators of biological collections.
- In contrast, there are a large number of [well-attended] short-term [whole organism based] courses, run by various organisations such as FSC, FBA, RHS, CIEEM, etc) – but these tend to focus on the ‘popular’ species, leaving many ‘Cinderalla’ taxa for which there is little or no expertise – these gaps need filling. The Linnean Society has a listing of these course providers on its website.
- Providers of tertiary courses might emphasise the range of potential job opportunities, illustrating this with examples of past students.
- Given the apparent anomalies between surveys undertaken by different consultants, it was recognised that stronger quality control needs to be applied to those making identifications which are used to inform policy and/or planning decisions.

Linnean Society Actions

- to redouble its efforts in education (primary through tertiary levels) to inspire students to pursue a career in taxonomy
- to continue in its advocacy role for taxonomy & systematics, playing an active role on the Taxonomy Coordinating Committee (TCC) and other initiatives such as the Natural Science Consortium, as well as exploring prospects for a ‘Biopartnering’ event for taxonomists to connect with industry

Powerpoint presentations are available on the website

Discussion session chaired by Professor Geoff Boxshall, NHM

Professor Geoff Boxshall (GB) introduced the discussion session, which was to be focused on **funding of taxonomy**. He observed that the meeting today had clearly demonstrated the importance of taxonomy to industry and government, with various partnerships being illustrated by the speakers.

GB reminded the audience of an **earlier survey** he had conducted during a review he undertook in 2010 for NERC (following the House of Lords review in 2009), in which 160 taxonomists had been asked where their funding (over £5k) came from: there were more than 70 different sources, showing what a pluralistic economy this is – which is good. Taxonomists cannot depend on RCUK, although that remains an important funding source.

GB then introduced the first of two RCUK representatives, namely **Colin Miles (CM) for BBSRC**.

Colin briefly outlined **BBSRC's funding strategy**, which was essentially to support basic (non-medical) biological sciences together with 3 strategically related areas of science, namely food security, industrial biotechnology/bioenergy and the biological sciences underpinning health, there being a about a 50:50 split between the basic and priority strategic areas. Although BBSRC does not support taxonomy as a priority area per se, it nevertheless supports the science of taxonomy in the context of research programmes which utilise the application of taxonomic techniques, citing for example, insect pollinators, tree health, and the ecology/infectious diseases of livestock (techniques vital to tracing diseases of livestock). BBSRC is particularly interested in projects involving generation of genomic and molecular data and the associated bioinformatics and statistical studies that allow those data to be interpreted and used. For example, research projects into plant, animal and human health, tracing and diagnosing bacterial and viral infections, and biotechnological applications, such as elucidating chemotherapeutics like Taxol, or identifying specific traits in species to identify species and/or compounds for medical use (antimicrobials/anti-cancers, precursor molecules, analgesics, etc) which rely on knowing the right source and selecting the right species, by applying taxonomic tools. Also involved in developing enzymatic activity from living organisms, especially in relation to replacements for fossil fuels, e.g. generation of biofuels. Lastly, BBSRC supports a wide range of biodiversity research associated with the ecological impact of biotechnological applications, farming is an obvious example of that, agricultural practices and the impact on the environment of growing new crops for biofuels. BBSRC is also responsible for looking after data, supporting The Genome Analysis Centre (TGAC); press releases recently, on evolution of cichlid fish, topological journals, are examples of BBSRC-funded work relevant to taxonomy. Also lead biosciences data provision in Europe. So BBSRC funds a range of science related to taxonomy but does not call it taxonomy (now or in the future), the challenge is not taxonomy *per se* but the science underpinning taxonomy.

John Day (Head of the Culture Collection of Algae and Protozoa [CCAP], which is NERC funded at the Scottish Marine Institute) spoke on behalf of **NERC**, having inherited the mantle as NERC's representative on the UK Taxonomy Coordination Committee.

NERC is a major funder of world-leading environmental research, of which biodiversity research is a vital component. Historically, NERC co-funded specific taxonomy-orientated initiatives such as CoSys and SYNTAX, which closed 2012, and there are no plans to reopen these programmes. However, any suggestion that NERC is “non-taxonomy-friendly” is not justified as it has over the years funded around 260 taxonomy-orientated projects to a value of £11.5m. NERC would actively like to encourage the T&S community to continue to submit high quality, cutting edge, relevant

proposals. At present, NERC funds in three areas, namely: Discovery science, Strategic science and National Capability. Like BBSRC, NERC National Capability includes genomic/molecular infrastructure components, as well as biological resources such as the CCAP (Culture Collection of Algae & Protozoa), which could be considered to be a microscopic botanic garden and zoo combined, green library, or a baseline live taxonomic database. NERC welcomes applications for funding under Discovery science or Strategic science – check their website for opportunities <http://www.nerc.ac.uk/funding/> In addition NERC has started to progress a new mechanism/process for feeding in worthy areas of research, looking at this twice a year, with fast turnaround, so think creatively and feed into this process. NERC also funds some skills gap training. Taking off his NERC hat, John emphasised that the wealth creation theme runs through everything, and that won't change, so one needs to think about how to build this in, e.g. taxonomy in bioprospecting for new pharmaceuticals, so added value can be created. He added that funding whether from NERC or other agencies is very competitive, so the quality of the science is, and will remain, the highest priority.

Professor Boxshall (GB) asked whether BBSRC also had a similar feed-in process from the community? CM replied, not at this stage.

The ensuing discussion included contributions from Professor Boxshall, Tammy Horton, John Day, Bente Klitgaard, Elinor Michel, Aljos Farjon, Joanne Porter, Colin Miles, Dianne Edwards, Gwilym Lewis, Alfried Vogler, Monique Simmonds, Sue Townsend. The following points were made:

There is a taxonomic component in quite obscure issues such as the impact of particulate plastics on the biosphere. We need to look more widely for opportunities for taxonomists! The issue of plastic in environment might be brought into the grand challenges for taxonomy now – the NERC thematic process would be a good mechanism.

With respect to taxonomy research related to deep sea mining, oil drilling in the marine environment is very localised, but when sucking up nodules over vast areas, what will the impact be? For example, with quarries, they just look at the surface, but how many studies look 30-40ft under the subsoil?

UK seabed resources will be mining in fracture zones, and will suck up seabed over wide areas; the plan is to manage process on wide scale. These areas are outside national jurisdiction and administered by International seabed authority. This survey work is trying to manage the taxonomy, understand the biogeography, etc, but we are finding that **80% of species are new to science**. There will be a workshop in November on macrofauna, to identify spp. and only the industry is supporting this.

It was suggested that the focus of the meeting was too national, and that we need to be **more international**; how about the EU? Let's do collaborative projects, club together. In the US, projects are for big groups plants or animal. Is it unrealistic to have an international approach, such as the Global Plant initiative (GPI)?

In previous discussions with NERC, it was clear that there is no appetite for ring-fenced money for taxonomy. There is a sense of prioritising topics but not ring-fencing. The US National Science Foundation is huge, while RCUK is already fragmented into distinct subject based research councils, so there is no appetite for further subdivision or ring-fencing, but one can never say never.

SYNTHESYS (EU funded infrastructure for natural history collections <http://www.synthesys.info/>) is now on its 3rd renewal. It survives because the demand is there across EU, it is well organised and tracks outputs, etc., so it is well perceived by the EU. So it can be done – it is possible to get funding

to support taxonomy but proposals need to have new goals and have some focus on novel methods or outputs.

In general, the EU commission wants to deal with mature discipline-based communities. In the US, for example, discipline based communities meet every 4 years or so, to discuss and decide on priorities. They then tell National Science Foundation (NSF) what they need. GB thinks the EU wants pan-European science disciplines to similarly coalesce around a common set of priorities, and go to them (the EU) to tell them what to do. Will it happen for taxonomy? **CETAF** (Consortium of European Taxonomic Facilities) <http://www.cetaf.org/> a taxonomic research network formed by 56 institutions has a good record of generating such coordinated projects, e.g. **SYNTHESYS**, **EDIT** (European Distributed Institute of Taxonomy, <http://www.e-taxonomy.eu/>), **ViBRANT** = Virtual Biodiversity Research and Access Network for Taxonomy. <http://www.slideshare.net/vsmithuk/bio-identify220910-vibrant>. See also <http://www.cetaf.org/news/what-your-vision-about-future-taxonomy>.

In the **NERC review of Taxonomy** in UK, the EU and NERC were equal as the top funders in taxonomy; then came UK government grants for the **Darwin Initiative** – a scheme for locally based projects worldwide, <https://www.gov.uk/government/groups/the-darwin-initiative>.

It was pointed out that it was difficult to make the business case for taxonomy unless and until we could solve the problem about ignorance re biodiversity. **There is no cost to the business community by leaving the world taxonomically ignorant.** It does not necessarily help business to know that there are more species. Businesses benefit only when taxonomic work produces findings with human applications/products. So how can we turn it around?

It was appreciated that the **business case** was always difficult to articulate. There had been positive examples presented today but some taxonomists have been reluctant to do it in the past. It has been a major difficulty - making ecologically-based arguments, but this was becoming easier now that **ecosystem services (ESS)** thinking and terminology has changed the dynamics of discussion. This happened rapidly: it was only in 1996 that Nature's 'valuing the earth' front cover focused attention onto ecosystem services, yet within 2 years, the EU had set up calls for networks on biodiversity and ecosystem services (ESS), and put real money into it. Not necessarily for research but to help the research community get its act together – this concept (ESS) clearly has traction for policy makers; a lot more businesses see that ESS help manage risk. So positive news, lots people outside the [biology] community get ESS and build business cases.

As a follow-on to ecosystem assessment, there is a need to link ecosystem services with the national economy – researchers can't just wave hands and say biodiversity is important. We need to work with the national office of statistics regarding natural capital, encompassing biodiversity/natural environment.

If taxonomists want funding to do a monograph on a group, they need to articulate the question they would be answering in the process.

Biologically different questions, can be difficult to reconcile, vocabulary may be right but taxonomy may die in between.

re ESS aspect - it is necessary for **society to understand taxonomy**. Taxonomy needs to be more focused on problem areas, areas of ignorance and areas of application. Much historical taxonomy was a gentleman's affair and pursuing the interest of the taxonomist. For example, one may have studied conifers a lot already; and been allowed to do that, the question is now, however, 'is it really the best group for you to study? is it now necessary to focus on deep sea benthic faunas, for example, as we

don't know much about them?' It is still apparent that the research focus may be on researchers' personal interests rather than on what society needs, but this is changing fast. Taxonomists have a responsibility to spend money on science that is relevant to Society. We need to articulate the relevance and importance and value of the problem.

With regard to the energy industry for example, a balance is needed between energy generation and ecological societal responsibilities, with qualified taxonomic input.

A lot of taxonomic knowledge has been banked, but now **many taxonomists are retiring**, a lot of experience and knowledge is being lost and not passed on to a much reduced new generation. Also, there is a risk that we underestimate the power of scientific study alone; but then it helps society.

How taxonomists can get together to help – maybe generate focused events to encourage dialogue. In business, one has '**biopartnering**' events, so maybe consider the possibility of biopartnering event for taxonomists to work toward a project on wealth creation.

There is **biotech phylogeny funding**, and a natural products partnering event based in Manchester, both had a need to get taxonomic expertise for identifying chemicals in organisms. These are possible networks to plug into – see BBSRC website for details.

A dialogue was needed also re **training**. There are a lot of organism- based courses offered by **Field Studies Council (FSC)** while **CIEEM (Chartered Institute of Ecology and Environmental Management)** courses are more on the environmental/ecological side plus identification. There's a **gap** in the level of courses offered – in universities – which reflects the loss of taxonomy/taxonomists from the university sector.

Another case study is the big demand for **stratigraphers** in the oil industry. In the NERC review it was found that all 4 remaining **micropalaeontology masters courses** had been terminated, all for understandable reasons: retiring teachers/taxonomists are being replaced by high-flying researchers who would possibly attract funding from an ever shrinking pool. There was a lot of feedback from industry, who take the issue sufficiently seriously to have a liaison officer with the micropalaeontology community. In the UK, there are more than 20 companies, the largest of which employs about 50 people, but there is a lack of dialogue between course providers and the industry, so we need a forum for dialogue.

It is unfortunate that the oil companies are prepared to fund PhDs/postdocs but seem unwilling to support MSc's as the step to this level. MSc courses were encouraged but no funding was made available, so students are reluctant to come in.

In the 1970s, **taxonomy was collections based science**, but it is now done in a different way at different institutes: thus, at NHM there is a split between **curatorial + research**, while to date at RBG Kew these groups work together. He felt it was important to keep collections and research together. His real concern after 40 years as a taxonomist is to see that taxonomists/researchers are encouraged to find their own external funding to fund their own institutes and to have a job. Curators are essential to collections-based science, yet they appear to be killing off curation as a core funded element of collections-based science.

The **IC/NHM Taxonomy & Biodiversity MSc** (which costs is £22k) has [surprisingly] been well attended by UK rather than overseas students. Other MScs do well, eg applied bioscience & biotechnology, forensic science; these courses have a taxonomy element but are not taxonomy *per se*. So a broader course does well. We need to think differently: what do we want to achieve and what attracts students, what's a sexy subject plus what are job prospects? Sadly the [false] perception of

taxonomy on the one hand and not very good job prospects on the other hand gives a poor impression. We were not getting it right, so these discussions are very important. We must think what is needed, and what students want to see.

National capability: there is a worrying lack of training across the full range of taxa. GB had analysed the available taxonomy/ID courses and found that courses were led by environmental legislation, which drives content and direction, so there are a lot of courses on general environment, and on bats, and newts as flagship species. FSC courses are predominantly focused on areas of public interest – as FSC needs to survive and offer courses that are wanted. So what about the **Cinderella taxa**? Where is the training for those Collembola, fungi, etc., that thinking doesn't get through – it's an area of ongoing concern, as we are faced with the gradual appearance of **gaps**. The situation **lacks a strategic overview**, which is an inherent problem that one faces. However, if you set up a committee then you can usually identify retrospectively who was on committee from the recommendations. It's difficult to take in all opinions.

There needs to be improvement in how industry presents itself re demand for services; universities will not be able to respond to a need for training, **unless there is a demand from the student base for courses**. There is a need for taxonomy in general. How this should be presented, the problems that taxonomy is addressing, and communication with policy makers and business need to be given priority. There are particularly big questions on how to present and what role specialisms have.

There was a challenge in institutes to encourage staff to **connect with industry**, as they speak a different language. Taxonomy is seen as a Service, not fundamental research, but industry can't do it itself, and that needs to be made clear.

We must be better at connecting with industry and articulating the importance of taxonomy.

We tend to stress the specific nature of taxonomy, and that it takes many years to gain expertise - but we all get better at any job, taxonomy is no different. We need to phrase our concerns differently.

To be provocative - taxonomists need to not think in terms of single species; this approach is too narrow. Clearly we can't specialise in all taxa, but **large-scale sequencing** can overcome this –put the 'soup' into the sequencer, and get results that way. We should think about ESS based on that, so a shortcut to taxonomy is to provide answers using large-scale sequencing. However, while this is fine for presence/absence answers, it does not provide quantitative data, and of course is dependent on the fact that the fundamental work on ID/sequencing must already have been done, and the sequencing databases of taxa be available for comparisons. There may be many unknowns. Ultimately, there needs to be reference to the type species. While the costs for large-scale sequencing are coming down, it's possible that a good field taxonomist can give the answer on the spot!

To end on a positive note, we do have **a model that works**, FSC collaborating with Manchester Metropolitan University, to provide a superb MSc, bringing in taxonomists and biological recorders, people who understand the tools of the taxonomy trade, so one to celebrate.

APPENDIX

Taxonomy & Systematics Plenary Programme and Abstracts 11th September 2014

Who needs taxonomists? 'Articulating future needs'

11.00 Welcome from the Conference Chairman:

Professor David Cutler, Linnean Society of London, LSL Taxonomy & Systematics Committee Chair

11.10 The petroleum industry in deep water? Environmental surveys and taxonomy in the deep sea

Dr Tammy Horton, National Oceanography Centre, Southampton

As part of the EIA process, the petroleum industry conducts environmental baseline surveys which frequently include samples of seabed fauna. Many specimens taken during deep-sea surveys are new to science. Our understanding of the ecology of new deep-water areas is limited by a shortage of taxonomists, and by poor curation of industry-collected samples. I will provide examples of our work with industry to provide guidance for best practice in curation of deep-water survey samples. The petroleum industry is contributing to a legacy of global deep-sea samples to be used by current and future generations of taxonomists and ecologists.

11.30 Understanding Nature's Value: Taxonomy and the work of DEFRA

Dr Robert Bradburne, Head of Science, Sustainable Land Management and Livestock Farming Department for Environment, Food and Rural Affairs (DEFRA)

I will describe Defra's current policy priorities and our strategic evidence requirements as set out in the new Evidence Strategy. I will then provide some examples of where taxonomy is relevant to our ongoing work and plays a part in meeting our national and international objectives. I will finish with some thoughts on future directions and the constant drive for innovation.

11.50 Making the right decisions: species and nature conservation

Dr Keith Porter, Evidence Access and Mobilisation Lead, Natural England

Species lie at the heart of nature conservation and being confident about the identification of a plant or animal is critical to this topic; we routinely use the status of wild species as a surrogate for health of the natural environment. The reduction of formal training in species recognition has had a significant impact on organisations that depend on identification skills.

An analysis of what information is needed, and who collects it, provides an insight into future priorities for species data. Actions being taken include increasing the skills and approach of those collecting data, and looking to use new molecular technology to support identification.

12.10 From Taxonomy to Taxol

Dr Joanne Porter, Associate Professor Marine Biology, Heriot Watt University

Dr Porter will discuss how having the advantage of the taxonomy was key in the rationale for pursuing the discovery of taxol (an anti-cancer treatment) that came from the yew tree, despite many setbacks and lack of support along the way.

12.30 Virus Taxonomy, Making Sense of the Multitude

Professor Peter Mertens, Leader Arbovirus Molecular Research Group, BBSRC Pirbright Institute

I will discuss how we identify certain viruses, using sequencing phylogenetic analyses and databases, to detect and identify specific virus species, serotypes and strains, as diagnostic methods for specific diseases, and as a basis to inform control strategies. I will use bluetongue virus as a model and refer to the latest outbreaks of BTV-4 in the Mediterranean region, and the threat of their spread to northern Europe and the UK.

12.50 Why Horticultural Taxonomy Matters

Dr Alistair Griffiths, Director of Science, Royal Horticultural Society Garden Wisley

Cultivated Plant Taxonomy facilitates trade valued globally at more than US\$17 billion annually. Horticultural Taxonomy provides essential knowledge that contributes in many ways to the sustainability of our planet and is a pivotal but often hidden service used by gardeners, practitioners and scientists in agriculture, conservation, design and heritage, the environment, forestry, horticulture, plant breeding, media and trade. Horticultural Taxonomy will play an increasing role in informing government policies and in addressing global challenges such as managing pests, improving human, animal and plant health, responding to climate change, conserving biodiversity and our environment and reducing the use of natural resources.

14.00 Why industry and regulators need taxonomists

Professor Monique Simmonds, Director of the Kew Innovation Unit, Deputy Keeper and Head of Sustainable Uses of Plants Group, Royal Botanic Gardens Kew

This talk will illustrate the importance of different forms of taxonomy to the commercial world – from mining companies to the food sector. The ability to identify plants and to assist with the naming of plants underpins many commercial activities. Although this talk will concentrate on plants, the importance of taxonomy to our understanding of all organisms that enter the trade and/or influence habitats is vitally important.

14.20 Species identification, ecologists, environmental managers: nurturing a sustainable symbiosis

Max Wade, Chair Steering Group Ecological Skills Research Project, CIEEM

A large proportion of the work undertaken by professional ecologists and environmental managers is underpinned by the correct identification of plant and animal species, and is achieved in five main ways: ability to identify a given species correctly, training by experts in species identification, the affirmation by or involving experts in species identification to correctly identify a given species, species identification by experts commissioned by ecologists and environmental managers, and provision of reliable databases of species information, primarily distributional. Informed by CIEEM's Ecological Skills Research Project, the presentation identifies key ways in which the role of the expert in species identification can be developed in these areas as an essential resource which has monetary value. CIEEM should thus help to sustain these experts to inform industry and government with respect to describing and making correctly informed decisions about biodiversity.

14.40 Who are the Trainers? Where are the ID Resources? Solutions for Field Identification and Taxonomy from one environmental charity

Sue Townsend, Biodiversity Learning Manager & Dr Rich Burkmar, Field Studies Council

The Field Studies Council (FSC) is an established environmental charity and relies on mostly fees for courses to fulfil its charitable objectives. In order to further Environmental Understanding for All, it is exploring future strategies to provide resources and trainers to aid field identification through an externally funded project called '**Tomorrows Biodiversity**'. Identification and recording skills are critical to monitoring schemes and the challenge is to draw together resources from a range of providers to ensure cooperation and partnerships to support volunteers and professionals in maintaining and developing robust data sets available to all. Sue Townsend and Rich Burkmar will lead through this charity's ideas on some future strategies to ensure continued connectivity throughout the sector.

15.00 Postgraduate teaching: the next generation of taxonomists

Professor Alfred Vogler, Imperial College, 'Taxonomy & Biodiversity' MSc course director

The dual role of taxonomy in species identification and phylogenetic analysis has wide application in virtually all areas of biology. Postgraduate training in taxonomy has to introduce the conceptual underpinnings in evolutionary theory, the increasingly sophisticated technologies for studying specimens, and the quantitative analysis of complex biodiversity data. The talk will show how the MSc in Taxonomy and Biodiversity jointly taught at the Natural History Museum and Imperial College London attempts to provide contemporary training in theory and methodology of taxonomy, but will also highlight the need for closer dialogue with potential employers about their requirements of taxonomy.

15.20 Taxonomy meeting Societal needs: a taxonomist's view

Professor Geoff Boxshall FRS, Natural History Museum

After just over 40 years in the Natural History Museum, I use this presentation to provide a fleeting glimpse of my work as a taxonomist. I briefly explore the role of taxonomy today, the changing nature of the outputs of taxonomic and systematic research, and the new resources available to support such work. On-line resources are not perfect but are improving rapidly. They help to increase efficiency, as well as opening up the basic resources to the global user community. New technologies permit finer resolution of problems of species identity but have also revealed problems with existing classification systems. Today, most new metazoan species found in Europe are described by volunteer taxonomists; but I still describe some and I will briefly explain how I decide which ones to work on and which ones to pass.

15.40—16.40

OPEN DISCUSSION

Chaired by **Professor Geoff Boxshall** FRS to address funding issues with contributions from representatives from BBSRC (**Dr Colin Miles**) and NERC (**Dr John Day**)

16.40 Natural History Near You - Putting Collections on the Map

Paolo Viscardi, Horniman Museum and NatSCA

Natural history collections provide a valuable resource for researchers, recorders, educators and artists. However, the dispersed and often local nature of collections can make finding them a challenging task.

The Natural Sciences Collections Association (NatSCA) is working to increase awareness of and access to collections through the Natural History Near You project. This takes a crowdsourcing approach, using freely available Google systems to build a database and map of collections in the UK with top-level information provided by the wider natural history community. This provides a simple system to collect and share useful information, which is intended to provide the basis of a more detailed system in the future.

16.50—18.00 Wine Reception in the Library

Participants (Speakers highlighted)

Alfried Vogler (NHM/IC)	Marcelo Tomé Kubo	Phoebe Richardson-Moy
Alistair Griffiths (RHS)	Maria Alvarez (RBG Kew)	Ray Heaton
Aljos Farjon (RBG Kew)	Mariana de Oliveira Büniger	Rhian Smith (RBG Kew)
B. L. Kaul	Mark Carine (NHM)	Rich Burkmar (FSC)
Bente Klitgaard (RBG Kew)	Mary Spencer Jones (NHM)	Richard Boyne (RBG Kew)
Brian Harding	John Day	Robert Bradburne (DEFRA)
Charlotte Couch (RBG Kew)	John G Day (SAMS/NERC)	Santelmo S. de Vasconcelos Jr.
Chris Raper (NHM)	John Millar	Sarah Whild (MMUniv)
D I Tomlinson	John P McFarlane	Stephen Jarvis
Daniel Brutto (SeaSurvey)	Josh Hatton (SeaSurvey)	Sue Townsend (FSC)
David Cope (RBG Kew)	Juliana Lovo	Sylvia Phillips (RBG Kew)
David Cutler (LSL)	Keith Porter (Natural England)	Tammy Horton (NOC)
David G. Frodin (RBG Kew)	Kristina Patmore (RBG Kew)	Tania Moura
David J Hamilton	M d Lourdes Rico-Arce (RBG Kew)	Trevor James (NFBR)
Ellinor Michel (NHM)	Max Wade (CIEEM)	Geoffrey Lewis
Estelle Robinson (FSC)	Miranda Lowe (NHM)	Emeline Favreau
Fiorella F. Mazine (UFSCAR)	Moira McManus	Carol Graves
Geoff Boxshall (NHM)	Monique Simmonds (RBG Kew)	Bill Baker (RBG Kew)
Gwilym Lewis (RBG Kew)	Oliver White	Shahina Ghazanfar (RBG Kew)
Heather Lindon (RBG Kew)	Paolo Viscardi (NatSCA)	Colin Miles
Irina Belyaeva (RBG Kew)	Paolo Viscardi Guest	Joanne Porter (HWUniv)
Jamie Dunning	Patrick Phillips	Phillip Farris
Jason Irving (RBG Kew)	Peter Gasson (RBG Kew)	
Joan Cramphorn	Peter Mertens (Pirbright Institute)	