PULSE

The LINNEAN SOCIETY of London

ISSN 1759-8036

ISSUE 31
NOVEMBER 2016

NEWS FROM THE LINNEAN SOCIETY OF LONDON – A FORUM FOR NATURAL HISTORY

LINNEAN LEARNING NEEDS YOU

Fellows of the Linnean Society: the Linnean Learning team needs your help! We're currently working on numerous exciting projects for primary and secondary schools, home educators, university students and lay audiences, and we really need your support. With Fellows in countries all over the globe working in diverse areas of the life sciences we're keen to utilise all of your knowledge, and would love to tap into your expertise. Your input could be as little as sending us one quick email, to running an exhibit at a careers or science festival.

Right now we have three specific projects that could use your help:

Careers Profiles

We recently conducted an extensive survey of university students to find out what they want from membership to a scientific society. Overwhelmingly we were told that careers advice and support is paramount as they don't feel enough is currently available to them online. So that's what we're aiming to give them. Over the next few weeks we'd like to profile as many of our Fellows as possible and make these available on our website. Not only will this offer career inspiration to students (and suggestions on how to go about achieving their goals), it will also show them that it's completely normal to not always have a plan straight out of university. Our Careers Profile questionnaire takes only five minutes for you to complete but could help shape the careers of the next generation of scientists! Access it here: https://goo.gl/2AAEHZ

Volunteering

We'd love to run a Careers Day from the Linnean Society HQ. In addition, our plan for the forthcoming academic year is to increase our presence on a local and national scale through science festivals and STEM outreach programmes. All of these events are going to require an enthusiastic team of volunteers, presenters and demonstrators. We received a substantial number of offers for running our exhibit at the Royal Society of Biology's Bioscience Careers Festival, and we'd love to continue involving Fellows in our outreach and engagement work. As such, we're setting up a database of Fellows who'd like to volunteer with us or take part in our events.

Images

Our online educational resources are hugely popular with tens of thousands of views per year, and our schools' Loan Kits are almost permanently fully booked. To keep our resources fresh and new, we have multiple projects at various stages of development (new worksheets and practicals, new Loan Kits, and a series of educational videos). However, all of these require a substantial number of images of different species and environments to see them to completion. So if you have a vast image collection

ABOVE: Asian elephants in Udawalawe National Park, Sri Lanka, courtesy Lizzie Webber FLS

or even just a handful of nice photos, we'd love to hear from you. We also need some drawings for illustrative purposes, so please let us know if you're skilled in this area too!

If you are interested in supporting the Education team through any of the means listed, then please email us at education@linnean.org. We'd really appreciate any help or time you can give.

Dr Rhys Grant
Education Officer

Herbie Rides Again
Conserving the Linnaean Herbarium Cabinet

Swedish design is famed the world over for its combination of form and function, and there is no better example of that than Linnaeus's own herbarium cabinet, held at the Linnean Society. The cabinet is now in need of modern conservation treatment, and a display case to properly exhibit and protect it. In aid of this, the Society has mounted a campaign to raise the several thousands of pounds that this will cost.

Prodigious Confusion

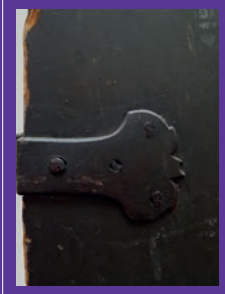
The cabinet—and the revolutionary way it was to be used—was described by Linnaeus in his *Philosophia Botanica* (1751), though he had probably been using this new method of specimen storage from the time he catalogued his own and George Clifford's herbaria in the 1730s. Herbaria (*hortus siccus*) were not new; they had been in existence from the 1500s (though arguably plant collecting had been in practice since antiquity). At this time it was the norm for botanists to work from specimens mounted into bound volumes, or by comparing new specimens with botanical illustrations, as depicted in this 1600s drawing of Dutch botanists at work. In 1735 Linnaeus had started work for George Clifford, a wealthy Dutch banker, cataloguing and organising his herbarium using his loose system of specimens mounted on to sheets, so by the time he travelled to London in 1736 to see the 230 volumes of Hans Sloane's bound herbaria, he had already overcome some of the practical difficulties that such a static system of storage of specimens presented.

Sloane's bound herbarium was described by another visitor as being in "true English fashion in prodigious confusion in one cabinet and in boxes". Several specimens were mounted on each page to save space. Though this kept everything neatly together, it created problems when it came to the systematic ordering of the collection, particularly when new a new species had to be added. Often Sloane had to paste new specimens into available spaces within an existing volume and include an appropriate cross reference, or start another volume entirely. Sloane himself admitted that of his specimens "many were not named, chiefly for want of leisure".

Conserving a Revolution

This was not Linnaeus's style. While he advocated working from real specimens, he also valued the ability to directly compare specimens side by side. Further, his practical system also allowed for expansion and revision; something that was not possible with a bound volume. What Linnaeus's herbarium cabinet did, with its loosely filed and mounted specimens, was to provide the practical botanist with a method of sorting, storing, accessing and revising the systematic grouping of preserved botanical specimens.

But what of our beloved cabinet? It was one of three that were purchased and shipped by Society founder James Edward Smith to England in 1784, and close inspection of the cabinet reveals where it was once sealed with wax in two places, perhaps as part of the preparations for that great voyage. The Society returned two of the three cabinets to Sweden in the 1930s, and these are now in Uppsala and Hammerby.



ABOVE:
The Linnaean herbarium cabinet and a close up of one of the hinges

LEFT:
Wax residue shows where the cabinet doors were once sealed

FAR LEFT:
Botanists worked from bound volumes of pressed specimens before herbarium cabinets, as shown here in *Botanicus* (ca. 1780–87) by Cornelis Ploos van Amstel
© Rijks Museum

The Linnean Herbarium cabinet will be conserved in Professor Gren Lucas' honour, to mark his recent retirement as the Society's Honorary Treasurer, his post for the last 20 plus years. The cabinet will not be restored, but conserved in accordance with modern museum ethics and standards. That means that it will be stabilised structurally, loose areas will be reattached, and the unfortunate scaring of the surface will be disguised so that it is not visually disturbing.

The cabinet appeal was launched at the Society's Conversazione on 8 July 2016 and it was my great honour to speak to those who had gathered to celebrate Gren's time with the Society. The conservation of the cabinet is a fitting tribute to honour Gren, having both served Linnaeus, taxonomy and the Society well for many years.

Making a donation is easy: if you would like to support the cabinet's conservation, interpretation and display please visit www.linnean.org/Linnaean-Herbarium-Cabinet to donate online, or contact the Executive Secretary (elizabeth@linnean.org).

Glenn Benson
Curator of Artefacts
With thanks to: Elaine Charwat, Lynda Brooks and Elizabeth Rollinson for their contributions and support.

Further reading

Muller-Wille, Staffan. 2006. Linnaeus' herbarium cabinet: a piece of furniture and its function. *Endeavour* (30)2.
Pavord, Anna. 2005. *The Naming of Names: The Search for Order in the World of Plants*
Wulf, Andrea. 2008. *The Brother Gardeners: Botany, Empire and the Birth of an Obsession.*

Cultural Courtyard

Burlington House on London's Piccadilly is home to five learned societies (Linnean Society of London, Society of Antiquaries of London, Geological Society, Royal Astronomical Society, Royal Society of Chemistry) and the Royal Academy of Arts. Our proximity to one another around the courtyard allows us to advance our individual society objectives as well as working together to provide a cultural hub for the arts and sciences.

We want to create a 'Cultural Courtyard' that will celebrate common threads between the Societies and allow us to make these institutions more accessible to the public. A new website is now bringing together each organisation's individual events as well as tours, events and exhibitions that link the Societies together. For more information about past and future events and projects visit **http://burlingtonhouse.org/**

ABOVE: Burlington House on Piccadilly is home to five learned societies and the Royal Academy of Arts © The Linnean Society of London

Digital Exhibition:

Poetic Botany–Art and Science of the 18th-Century Vegetable World

Poetic Botany: Art and Science of the 18th-Century Vegetable World is a digital exhibition that brings together historical and contemporary resources—illustrations, photographs, videos, texts, and more—in an attempt to facilitate an experience not possible in a traditional museum setting.

An overarching aim of the exhibition is to reveal that plants, like humans, are agents of historical change. Another aim is to reaffirm that the imagination is an ecological force, responsible for how we have thought of nature in the past, how we think of it now, and how we will think of it in the future. The imagination, moreover, flaunts any boundary imposed on it by disciplines or areas of expertise, showing itself to be at home as much in the arts as in the humanities as in the sciences.

Any view of nature, then, that ignores a discipline or entire domain of disciplines is necessarily deficient. At the same time, paradoxically, any view that sacrifices the expertise that results from the focus of one of these disciplines will also be severely impoverished.

Hence, a complete view of nature can only result from an openness to the work of one another, from an ongoing collaboration and commitment to understand the more-than-human world through art, scholarship, and science.

Poetic Botany celebrates this very effort, along with the artists, scientists, and scholars of both the eighteenth-century and our own time. These figures attempt to understand the vegetable world, and in so doing offer us a wealth of perspectives that substantially enrich our own engagements with nature. Visit the exhibition http://www.nybg.org/poetic-botany

Ryan Feigenbaum
Curator of the Digital Exhibition, The New York Botanical Garden

FAR LEFT:
Adonis annua
Poetic Botany exhibition/
Alberto Salguero

LEFT:
Cereus speciosissimus
from Curtis's Botanical Magazine (1835)

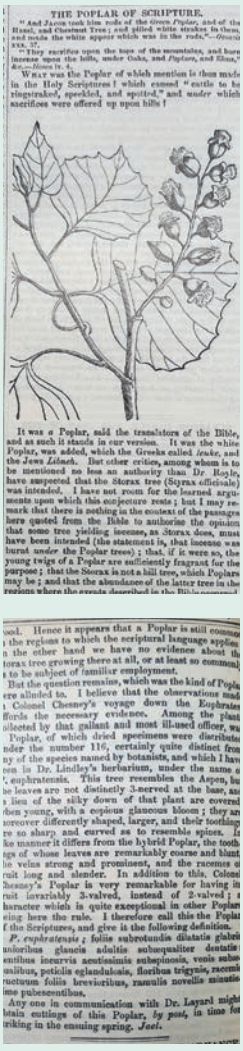
A MESOPOTAMIAN CONUNDRUM

The Flora of Iraq Project

In 1966, the first two volumes of a projected nine-volume *Flora of Iraq* were published by the Royal Botanic Gardens, Kew (RBG Kew) in association with the Iraqi Ministry of Agriculture & Rural Development. Despite interruptions, the project is now approaching completion and two of the remaining three unpublished volumes are in draft or on press. However, one of the questions that has been encountered is whether to assign old plant records from 'Mesopotamia' to modern Iraq. I have been investigating the poorly localised collections made under the direction of the then Colonel Frances Rawdon Chesney in 1836 during a military expedition travelling in two steamships along the Euphrates river. While solving the rather baffling problem of where the plants were actually collected, it emerged that the collectors themselves were a Czech-born naturalist and physician, Jan Vilém Helfer (then aged around 26) and his wife Pauline (a German-born Huguenot), and not the leader of the expedition whose name appears on the specimen labels. They had joined the group as supercargo, offering valuable medical support to the crews.

Navigation and Loss

The Chesney Expedition had echoes of Fitzcarraldo, in that a brace of paddle-steamers built in kit form by Lairds in Birkenhead was hauled overland through Latakia, then part of the Ottoman Empire, to be launched near Birecik in what is now southern Turkey. Chesney aimed to prove that the Euphrates was navigable and could offer a shorter route to India; his experiment pre-dated the construction of the Suez Canal. Plants collected along the route were sent back to London to botanist John Lindley, who then shared them with Antonio Bertoloni of Bologna, Italy. The new species he described were published in Bologna; Lindley published a single new species from the collection, *Populus euphratensis*, in the *Gardener's Chronicle* of 1849 under the pseudonym 'Jael'.


THE POPLAR OF SCRIPTURE.

"And JACOB took him rods of the green *Poplar*, and of the Hazel, and Chestnut Tree; and pilled white streaks in them, and made the white appear which was in the rods."—*Genesis* xxx. 37.

"They sacrifice upon the tops of the mountains, and burn incense upon the hills, under Oaks, and *Poplars*, and Elms," &c.—*Moses* iv. 4.

WHAT was the Poplar of which mention is thus made in the Holy Scriptures? which caused "cattle to be ringstraked, speckled, and spotted," and under which sacrifices were offered up upon hills?

It was a Poplar, said the translators of the Bible, and as such it stands in our version. It was the white Poplar, was added, which the Greeks called *leuke*, and the *Jews Libneh*. But other critics, among whom is to be mentioned no less an authority than Dr. Royle, have suspected that the Storax tree (Styrax officinale) was intended. I have not room for the learned arguments upon which this conjecture rests; but I may remark that there is nothing in the context of the passages here quoted from the Bible to authorise the opinion that some tree yielding incense, as Storax does, must have been intended (the statement is, that incense was burnt *under* the Poplar trees); that, if it were so, the young twigs of a Poplar are sufficiently fragrant for the purpose; that the Storax is not a hill tree, which Poplars may be; and that the abundance of the latter tree in the regions where the events described in the Bible occurred

wood. Hence it appears that a Poplar is still common in the regions to which the scriptural language applies. On the other hand we have no evidence about the Storax tree growing there at all, or at least so commonly as to be subject of familiar employment.

But the question remains, which was the kind of Poplar here alluded to. I believe that the observations made by Colonel Chesney's voyage down the Euphrates affords the necessary evidence. Among the plants collected by that gallant and most ill-used officer, was a Poplar, of which dried specimens were distributed under the number 116, certainly quite distinct from any of the species named by botanists, and which I have seen in Dr. Lindley's herbarium, under the name of *P. euphratensis*. This tree resembles the Aspen, but the leaves are not distinctly 3-nerved at the base, and a lieu of the silky down of that plant are covered when young, with a copious glaucous bloom; they are moreover differently shaped, larger, and their toothings are so sharp and curved as to resemble spines. In the manner it differs from the hybrid Poplar, the tooth of whose leaves are remarkably coarse and blunt, the veins strong and prominent, and the racemes of fruit long and slender. In addition to this, Colonel Chesney's Poplar is very remarkable for having its fruit invariably 3-valved, instead of 2-valved; a character which is quite exceptional in other Poplars, being here the rule. I therefore call this the Poplar of the Scriptures, and give it the following definition.

P. euphratensis; foliis subrotundis dilatatis glabris utrinque glaucis adultis subaequaliter dentatis dentibus incurvis acutissimis subspinosis, venis subtus prominulis, petiolis eglandulosis, floribus trigynis, racemis fructuum foliis brevioribus, ramulis novellis minutissime pubescentibus.

Any one in communication with Dr. Layard might obtain cuttings of this Poplar, *by post*, in time for striking in the ensuing spring. *Jael.*

The voyage was not without incident. The Helfers witnessed the sinking of the paddle steamer *Tigris* during a tornado; the Colonel, who was on board, survived, but 22 hands were drowned and most of the expedition's papers were lost. The other, larger, steamer *Euphrates* survived the storm and after a trip to Bushehr on the open sea it was used to explore the Tigris and other rivers.

One of the birds observed on the expedition was the now very rare Bald Ibis. Some of those that were shot in Syria and Iraq were preserved and taken to the Zoological Society of London (ZSL), and are now kept in the Natural History Museum at Tring (NHM Tring). Others were simply eaten.

The Helfers left the expedition in Iran and travelled on to India. After collecting there and briefly settling in Burma they made a plant-collecting trip to the Andaman Islands in the Bay of Bengal, where Jan Helfer was struck by a poisoned arrow and killed, aged 30 years. Helfer's widow remarried, becoming the Countess Nostitz in the process, and published a vivid account of the expedition, which appeared in translation in 1878. Colonel Chesney pursued a military career in India and Malta, going on to become General, and retiring to Northern Ireland.

The History of the Project

The Flora of Iraq project was initiated by Cliff Townsend (Kew taxonomist), Evan Guest (former colonial official in Iraq) and Ali al-Rawi (Iraq) and involved several Kew herbarium staff. The montane and alpine flora was covered in Karl Heinz Rechinger's monumental *Flora Iranica* (1963–) and the lowland flora by Rechinger's *Flora of Lowland Iraq* (1956). But there was an urgent need for a modern synoptic treatment, not least because of Iraq's position at the intersection of several phytochoria and its importance as the source of the progenitors of many important crop plants. By 2016, six out of the nine projected volumes had been published in full or in part (vol. 5 part 2 appeared in 2015, and vol. 5 part 1 in 2016). The

FAR RIGHT:
General Francis Rawdon Chesney FRS in 1863
© WikiCommons

RIGHT:
New species *Populus euphratensis*, published by John Lindley under the name 'Jael'
© The Linnean Society of London

LEFT:
A specimen of Black Francolin, *Francolinus francolinus*, labelled "Euphrates Expedition" and now at the Natural History Museum, Tring. Further research is needed to identify the collector
© The Trustees of the Natural History Museum, London

BELOW RIGHT:
Moltkia angustifolia, collected on the Chesney expedition, now in the herbarium at the Royal Botanic Garden Edinburgh
© Royal Botanic Garden Edinburgh

BELOW LEFT:
The paddle steamers *Tigris* and *Euphrates* in action on the Euphrates river. Note the Turkish flag–at that time the whole area was under the control of the Ottoman empire
© Athenaeum Library, Liverpool

monocots were completed in two volumes (8 and 9) and the single largest family Asteraceae will appear as volume 6. The final volume (7) is currently in preparation under the joint editorship of Shahina Ghazanfar FLS and myself. It is being published by Kew Publishing with financial support from the Iraqi Ministry of Agriculture & Rural Development. Here I must also acknowledge a grant from the Linnean Society's Appleyard Fund, which has covered my travel and accommodation costs during visits to Kew. The Bentham-Moxon Trust also funds visits by Iraqi botanists and others, who come to Kew to work on the collections.

Some might see this traditional Flora with keys, descriptions, figures and specimen citations, as anachronistic in this era of modern web-based systems. But the project embraces two separate processes: research into the taxonomy and distribution of Iraqi plants, which is greatly assisted by online access to reference collections and botanical literature; and the accurate naming of preserved material, which is vital for future investigations. A recent paper by Z.A. Goodwin *et al.* (2015) highlighted the lamentable state of naming of many of our taxonomic reference collections. It is a symptom of under-resourced curatorial teams, as well as the redirection of research funds away from alpha-taxonomy. Floras that cite specimens in *extenso* are now a rarity.

Another noteworthy aspect of the Flora is its focus on vernacular names, both in Arabic and Kurdish, and of economic uses. The literature on plant names can be traced back to some of humankind's earliest written records, and an iLink project has just been launched to study the botanical component of ancient

Mesopotamian cuneiform texts involving staff at RBG Kew and Madrid.

Evan Guest, the original co-editor of the Flora, made a detailed study of collecting localities, and was responsible for preparing the gazetteer published in volume 1 (with supplements in subsequent volumes). While researching the Euphrates Expedition, it became clear that the spellings adopted on the specimen labels were extremely garbled. Poorly labeled collections from the upper Euphrates (equating to modern Syria and southernmost Turkey) were sent back overland from Balis in early May 1836, and these were the last to be collected before the expedition entered Iraq. Almost none of the Iraqi material is localised (apart from one specimen from Babylon).

Chesney's exploits in Mesopotamia earned him a Fellowship of the Royal Society; his diplomatic skills, and his prior experience of rafting along the Euphrates had made him well qualified for the task. The collections made under his supervision are now to be found in numerous herbaria; the most complete set appears to be in Cambridge, UK (mostly in the Lindley herbarium) while many are also to be found in Berlin, Bologna, Edinburgh, Geneva, London (NHM and RBG Kew), Paris, Vienna and Cambridge, USA (in the Gray herbarium).

John Edmondson FLS
Hon. Research Associate, Royal Botanic Gardens, Kew

Further Reading
Chesney, General Francis Rawdon. *Narrative of the Euphrates Expedition carried on by Order of the British Government*. Longmans, Green (1868).
Guest, J.S. *The Euphrates expedition*. Routledge (1992).
Mlíkovský, J. Ornithological records made by Jan Vilém Helfer in Syria in 1836. *Sylva* 48: 167–170 (2012).
Pauline, Countess Nostitz. *The travels of Doctor and Madame Helfer in Syria, Mesopotamia and Burmah and other lands*. Richard Bentley & Son (1878).
Goodwin, Z.A., Harris, D.J., Filer, D., Scotland, R.W. & Wood, J.R.I. Widespread mistaken identity in tropical plant collections. *Current Biology* 25(22): 1066–67 (2015).

Growing our Knowledge of Grasses

A SUMMARY OF THE EVENT

Many people do not realise that 'grasses' are not just the ubiquitous little plants we find in our gardens and on our lawns; they are actually one of the most diverse and useful of all plant groups, with almost 12,000 species known across the world. The grass family (Poaceae) feeds the world: with wheat, rice, maize, sorghum and sugar cane all belonging to Poaceae. The grass family also covers over 25% of the world's land surface with natural grasslands and savannas.

Many of the foundations of grass classification have been built by scientists from Royal Botanic Gardens, Kew (RBG Kew) from the 1800s onwards, including George Bentham, Joseph Hooker, Otto Stapf, Charles Hubbard and Norman Bor. Using their knowledge of the small and complex reproductive parts, they have constructed a classification system which is relied upon throughout the world. Kew grass specimens have been consistently identified to a high standard, and Kew's herbarium collection serves as a reference library of grass diversity.

Grass Celebrity Derek Clayton turns 90

The most famous modern grass taxonomist at RBG Kew is Derek Clayton; he assembled data on all grasses of the world and published the reference book *Genera Graminum* in 1986. This compendium of information allowed the study of grass diversity to take a leap forwards, and paved the way for later computerised systems. Despite the success of the book, Derek realised that a database would be more suitable, providing a more flexible means of storing and presenting information in the longer term. As a result, he built the first comprehensive taxonomic database, called GrassBase, which is now an active repository for species descriptions and associated data (Vorontsova *et al* 2015; Clayton 2016).

Classifying Grasses

On 18–19 July 2016 members of the worldwide community of scientists studying grasses gathered at the Linnean Society of London to congratulate Derek on his 90th birthday and celebrate his amazing work, as well as to discuss future research directions and the continued development of GrassBase. Eighty delegates attended and listened to 29 presentations by scientists from Australia, China, France, Madagascar, Russia, South Africa, Switzerland, UK and the USA.

Following a welcome from RBG Kew Director Richard Deverell, the morning session of the first day traced the history of Poaceae classification at RBG Kew, placing it at the centre of the British Empire's plant specimen exchange network. After Gren Lucas and Steve Renvoize set the scene describing the generations of taxonomists who built the grass species knowledge base, Tom Cope spoke about the principles of classification, Derek Clayton presented his work on GrassBase, and Terry Macfarlane described grass taxonomic databases in Australia (a specialist region for the development of descriptive taxonomy software). Rob Soreng compared the two latest Poaceae classification systems in current use: Kellogg (2015) and Soreng *et al.* (2015). In spite of being perhaps the best known large family of flowering plants, c. 50 out of 700 grass genera still lack DNA sequence data. In addition, incomplete understanding of hybridisation and reticulate evolution can cause difficulties in producing classifications, and the current state of knowledge is still far away from anything like a final consensus taxonomic system for the family.

Evolution and Phylogenetics

The exact origins of the grass family remain mysterious, and Jerrold Davis reviewed the current state of knowledge and recent data from full chloroplast genomes. Lynn Clark presented an

ABOVE:
Grasses feed the world–the rice terraces of Guilin, China
© Leonie Berwick

BELOW RIGHT:
Grass meeting participants outside the Linnean Society on 18 July
© The Linnean Society of London

overview of the complex polypoid history of the bamboos: Poaceae subfamily Bambusoideae. Paul Peterson explained his extensive work on collecting, sequencing and rearranging the classification of tropical grasses called the Cynodonteae. Poaceae tribe Andropogoneae is a group of grasses which contains sugar cane and maize, and Elizabeth Kellogg explained the significance of paired spikelets which define this group. Nigel Barker presented a survey of knowledge gaps in African grasses. Marina Olonova and Wenli Chen covered in-depth studies of Asian *Poa* and *Miscanthus*. Peter Linder presented the last talk of the day summarising long-term multidisciplinary research on the evolution and global spread of the danthonioid grasses.

Day two of the meeting stepped beyond the grasses themselves and into broader interdisciplinary science. Caroline Lehmann presented research on the contrasting C3 and C4 grassland and savanna vegetation assemblies of different continents. Colin Osborne explained his research into the C4 photosynthetic pathway and its relationship to plant physiology, flammability and environmental dominance. The outermost epidermis cell layer in the grasses is different from other plants in its sequence of long and short cells, the shape of stomatal cells and production of silica bodies called phytoliths, as reviewed by Paula Rudall. Lynn Clark and colleagues investigated leaf shape evolution to understand the transition of ancient grasses from forest to open environments. Pascal-Antoine Christin discovered lateral gene transfer in the evolutionary assembly of photosynthesis genes and challenged fundamental assumptions in the field of phylogenetics. Guillaume Besnard demonstrated the use of large-scale DNA sequencing to study extinct species.

Growing Forward: GrassBase in the Future

A new generation of grass specialists, graduate students and postdoctoral researchers also presented their work. Marjorie Lundgren and Luke Dunning used sequence data to understand the evolution of *Alloteropsis semialata* and *Themeda*. Polina Gudkova combined morphological and molecular data to classify Siberian *Stipa*. Nanjarisoa Olinirina Prisca listed the endemic grasses of central Madagascar, and Jan Hackel itemised all grass radiations that have colonised Madagascar. Mark Lee presented new data on forage grass nutrition, greenhouse gas emissions, and links to climate change.

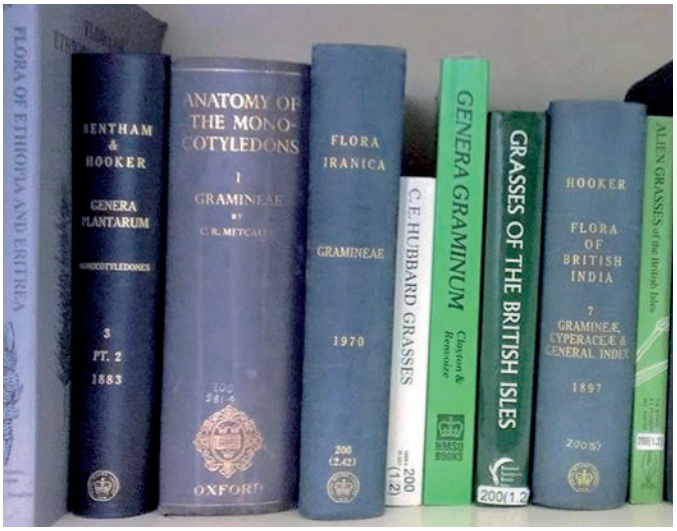
But what of the future? Abigail Barker presented Kew's new web plant information platform, the Plants of the World Online Portal. Maria Vorontsova argued that grasses remain a natural model group for information management and e-taxonomy and highlighted the challenges of maintaining trait data.

Scientific research moves ahead through a myriad of independent research projects, advised by a globally interconnected community of scientists. This meeting provided a platform to showcase the multifaceted work being carried out on so many different aspects of the grass family. Research programmes have been given a boost of inspiration. Collaboration will continue and the community will build on Derek's work to better understand grasses, to help produce better crops and to improve our understanding of managing the world's ecosystems.

Dr Maria Vorontsova
Research Leader (Grasses), Royal Botanic Gardens, Kew
M.Vorontsova@kew.org

Meeting Organising Committee: Maria S. Vorontsova (RBG Kew, UK); Sylvia Phillips (RBG Kew, UK); David Simpson (RBG Kew, UK); Elizabeth Kellogg (Donald Danforth Plant Science Center, USA); Rob Soreng (Smithsonian Institution, USA)

ABOVE:
Derek Clayton explaining GrassBase at the meeting
© Maria Vorontsova



LEFT:
Some of the reference publications on grasses written by scientists at RGB Kew over the last 130 years
© Maria Vorontsova

References

Clayton, W. D., Vorontsova, M. S., Harman, K. T. & Williamson, H. 2016. *GrassBase: The Online World Grass Flora*. Available online

Kellogg, E. A. 2015. Poaceae. XIII: i–xv, 1–416. In K. Kubitzki (ed.) *The Families and Genera of Vascular Plants*. Springer Verlag, Berlin.

Soreng, R. J., Peterson, P. M., Romaschenko, K., Davidse, G., Zuloaga, F. O., Judziewicz, E. J., Filgueiras, T. S., Davis, J. I. & Morrone, O. 2015. A worldwide phylogenetic classification of the Poaceae (Gramineae). *Journal of Systematics and Evolution* 53(2): 117–137. Available online

Vorontsova M. S., Clayton,W. D. & Simon, B. K. 2015. Grassroots e-floras in the Poaceae: growing GrassBase and GrassWorld. *PhytoKeys* 48: 73–84. doi:10.3897/phytokeys.48.7159. Available online

FORTHCOMING EVENTS 2016/2017

2 Dec
Evening Meeting
18.00–19.00

The Invention of Nature
FOUNDER'S DAY LECTURE 2016
Speaker: *Andrea Wulf, Winner of the Royal Society Insight Investment Science Book Prize 2016*
No registration required

6 Dec
Evening Meeting
16.00

On You, Inside You: The Amazing World of Parasites
IRENE MANTON LECTURE 2016: Taking place at Manchester Museum
Speaker: *Dr Sheena Cruickshank, University of Manchester*
Registration is essential:
https://www.linnean.org/Irene-Manton-Manchester

6 Dec
Lunchtime Lecture
12.30–13.00

The Botany of Christmas
Dr Mark Nesbitt, Royal Botanic Gardens, Kew
Registration is not necessary

18 Jan 2017
Lunchtime Lecture
12.30–13.00

Josef Frank: Patterns–Furniture–Painting
Speaker: Celia Joicey, Fashion and Textile Museum London
Registration is not necessary

19 Jan
Evening Meeting
18.00–19.00

From Genome Evolution to Animal Diversity: A Tale of Moths and Mammals
Speaker: Prof Peter Holland, University of Oxford
Registration is not necessary

1 Feb
Lunchtime Lecture
12.30–13.00

Anglo-Nepalese Zoological Illustrations: Colonial Naturalists and London Scientific Institutions in the Early-19th Century
Speaker: *Dr David Lowther, Durham University*
Registration is not necessary

9 Feb
Nature Reader
18.00–19.00

So Many Celestial Animals So Vividly Drawn: Birds and their Images in Pre-Nature Reader Linnean Italy
Speakers: *Henrietta McBurney Ryan FLS and Carlo Violani FLS*
Registration is not necessary

Please check our website for other events not listed here

Liz Mcgow: Archivist

© Leonie Berwick

Liz Mcgow joined the team in early September as the Society's first permanent full-time Archivist. Liz was originally inspired to pursue a career in archives whilst working as a student at Buckingham Palace and Windsor Castle in a customer service role, where she had a brush with the Royal Archives. After graduating with a Masters in Classics from Durham University in 2009, she volunteered at and worked in various archives, including the Royal Archives and Oxfam Archives, and completed a PGDipl in Archives and Records Management from University College London in 2012.

Liz has completed several large-scale cataloguing and digitisation projects at a number of institutions including Lambeth Palace Library, the Royal Society, the Royal London Hospital Archive and the Wallace Collection. At the Wallace Collection, Liz introduced new policies for managing archive collections, tested the suitability of a museums database for cataloguing archive material, wrote cataloguing guidelines, and arranged for conservation work to be carried out. She also worked for a short time as the Archivist & Records Manager at the Paul Mellon Centre for Studies in British Art which involved advising architects on preservation requirements for new storage rooms during a large expansion project at the Centre, and overseeing the move of collections in to storage during building work.

Liz developed an interest in the natural sciences after cataloguing botanical papers at Royal Botanic Gardens, Kew, and transcribing documents for the Alfred Russel Wallace correspondence project at the Natural History Museum, London. She says: "I am delighted to be starting at the Linnean Society and am looking forward to working with such fascinating collections." Welcome Liz, from all the team at the Society.

Congratulations Sara Oldfield OBE FLS

Everyone at the Linnean Society would like to offer their congratulations to Sara Oldfield FLS who has been awarded an OBE for services to the Conservation and Protection of Wild Tree Species Worldwide. For over 25 years Sara has been involved in assessing the world's trees for the IUCN Red List of Threatened Species. She established the Global Trees Campaign a joint initiative of Fauna & Flora International (FFI) and Botanic Gardens Conservation International (BGCI) which takes action to conserve priority tree species. Sara was Secretary General of BGCI for ten years and continues to work with BGCI on the Global Tree Assessment which aims to assess the conservation status of all trees by 2020. Congratulations Sara!

© Sara Oldfield

The LINNEAN SOCIETY of London

The Linnean Society of London
Burlington House, Piccadilly,
London W1J 0BF UK

T: +44 (0)20 7434 4479
E: leonie@linnean.org
W: www.linnean.org

Manufactured in the UK, using paper with a minimum 75% recycled content that is FSC accredited. Printed to ISO 14001 accreditation.

Charity Reference No. 220509

PULSE

All articles welcome – please submit news, reviews, events and articles in MS Word format to the Editor at leonie@linnean.org. Accompanying images must be a high resolution JPEG or TIFF with appropriate permission and copyright.