The LINNEAN SOCIETY of London

The Linnean

NEWSLETTER AND PROCEEDINGS OF THE LINNEAN SOCIETY OF LONDON

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Marimo
When is a moss ball not a moss ball?

Alexander Gibson FLS
Museum in India celebrates Fellow

Devonian Discoveries
First fossils at Rhynie

AND MORE...

A forum for natural history

The Linnean Society of London

Burlington House, Piccadilly, London W1J 0BF UK

Toynbee House, 92–94 Toynbee Road, Wimbledon SW20 8SL UK (by appointment only)

☎ +44 (0)20 7434 4479
✉ info@linnean.org
www.linnean.org
@LinneanSociety

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The Linnean is published twice a year, in April and October. All contributions are welcome, but please contact the Editor or see the *Guidelines for Contributors* document on our website before writing and submitting articles (www.linnean.org).

Articles should be emailed to the Editor in MS Word format, or sent on disc. Images should be sent as JPEGs or TIFFs at no less than 300dpi. Correct copyright information for images should accompany the article.

Cover image: *Cladophora*, Lake Akan from Flickr/Yu-Chin Lin

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The Linnean

Newsletter and Proceedings of the Linnean Society of London

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Editorial

Last year the Society's current journal publishing contract with Wiley Blackwell came up for review and was put out to tender. A decision was made to move the Society's journal publishing to Oxford University Press but the new contract does not include provision for the printing and distribution of *The Linnean*, so this will be the last issue to go out through Wiley Blackwell. Future issues will be printed and distributed using independent printers in the same way as the Society produces paper copies of *PuLSe* and other printed materials, and Fellows should see no change in distribution or quality of product.

This issue includes the Minutes of the Anniversary Meeting and, as before, the citations for medals and awards have been edited to reduce their length but retain the key reasons for the nomination.

We plan to include more book reviews in the immediate future. Rather than have them spread through the Society's journals, all book reviews will be available in *The Linnean* and *PuLSe*. If you are interested in becoming a book reviewer for *The Linnean* please let me know; guidelines for reviews will be sent out upon request, and will be online (www.linnean.org/thelinnean). Please also keep submitting your correspondence, as well as longer articles likely to be of interest to the Fellowship.

I must also express my thanks to members of the Linnean Steering Group for reviewing and contributing helpful feedback on submissions.

Gina Douglas, *Editor*
gina@linnean.org

Following the results of the EU referendum in June, the Linnean Society is contributing to the Royal Society of Biology's efforts to ensure that the biological sciences are firmly on the agenda. Collaboration (and access to funding) with EU partners is hugely important to research across all disciplines, and the UK does not want to be left a fringe player. Questions also arise regarding legislation, where the UK is signed up as an EU member, especially legislation pertaining to biodiversity, such as the CBD and CITES. It was timely therefore that at the end of September the Society's Taxonomy & Systematics Committee focused its Plenary Session on understanding and implementing environmental legislation, especially the Nagoya Protocol, providing a forum for discussion on this evolving issue.

The Society, together with the Systematics Association, was delighted to announce the 31 recipients of the 2015/16 Systematics Research Fund awards, with projects encompassing a wide range of geographies and species. The Society also hosted a day meeting in September for MSc students from the Royal Botanic Gardens, Kew and Queen Mary University of London to present their research projects, while Key Stage 3 pupils, together with their teachers and families, thoroughly enjoyed the BioMedia Meltdown (BMM) Project Celebration evening on Ecosystems. The Society is growing its education team by retaining Ross Ziegelmeier (current BMM Project Manager) to implement our *'Placing the Collections at the Centre of Education and Public Engagement'* project, producing brief, curriculum-linked videocasts about items in the Society's Collections. Hazel Leeper, our productive Education Officer for almost four years, left in June to pursue a PGCE, and we are delighted to welcome Dr Rhys Grant fresh from his post-doctoral studies at Cambridge University—Rhys hopes to generate replicas for educational use via 3D printing, a facility that would be especially useful where original heritage items are too delicate for handling. Rhys is also gathering feedback from students all over the country in order to help us better understand what they would like from the Society, and will be participating in the Bioscience Careers Festival at Kings College Cambridge, amongst other events.

Prof Gren Lucas OBE FLS receives an original watercolour of the Library by Helen Cowdy from President Paul Brakefield

Of course, the Society's major change has been the retirement in May of Professor Gren Lucas OBE HonFLS, the Honorary Treasurer for 21 years. Gren's remarkable contribution to the Society was celebrated at the Conversazione in July, when many friends and colleagues gathered to pay tribute to his outstanding service—he leaves the Society in excellent financial fettle and is continuing to work closely with the incoming

A young Charles Darwin joined us for Open House

Treasurer, Deborah Wright, in particular on plans to develop the Society's asset of Toynbee House, which has doubled in value since purchase in 2012.

Collaborative events around Burlington House Courtyard continue to be highly successful, with the five Societies variously participating in the summer *C*ourtyard Lates; our Deputy Librarian, Elaine Charwat, ran *Nature and the Enlightenment* tours in July. Other popular events have been the Society's Symposium at the Arnold Arboretum of Harvard University in Boston, where a number of UK and US FLS presented, the Debate on evolutionary medicine chaired by Paul Jepson, the Science Policy lecture by Kevin Gaston and the two-day meeting on grasses in honour of Derek Clayton's 90th Birthday. The autumn lecture season opened with Philip Stevenson's outstanding presentation on pollinators *Sex, Drugs and Ecosystem Services*, and yet another well-attended Open House day on 17 September, followed by the exciting 'Wild New Territories' event *Portraits of the Urban and the Wild*, linking cultural and environmental ecologies.

There are many more treats in store, including wildflowers, *Springwatch*, de-worming and ethnobotany, so check the new Events Brochure and website, and be sure to join us for the Founder's Day lecture when prize-winning author and historian Andrea Wulf will tell us about Alexander von Humboldt and *The Invention of Nature*.

Elizabeth Rollinson, *Executive Secretary*
elizabeth@linnean.org

Library News

It is very pleasing to report that two new staff appointments have been made recently. In August Andrea Deneau returned to the Society as our new part-time Digital Assets Manager. She is currently undertaking a systematic audit of the Online Collections. In September we welcomed Liz McGow to the team as our Archivist. She was previously working on a project at the Royal London Hospital and has experience of working at the Royal Society and the Paul Mellon Centre, as well as volunteering on the Alfred Russel Wallace Correspondence Project. Our team of volunteers has also grown, with the addition of Layla Fedyk who is cataloguing our original artworks on paper, starting with the illustrations accompanying the Society Papers. The AdoptLINN scheme continues to attract much interest. The Deputy Librarian, Elaine Charwat, reports that there are now 11 main Adopters contributing to the conservation and preservation of some of our most worn and fragile volumes. In one case, an Adopter rallied support from family, friends and colleagues around the globe to make it possible for us to conserve John Stackhouse's fascinating fungus notebook. For further information visit **www.linnean.org/AdoptLINN**

"In one case, an Adopter rallied support from family, friends and colleagues around the globe to make it possible for us to conserve John Stackhouse's fascinating fungus notebook."

The Society has also been involved with the EU-funded READ (Recognition and Enrichment of Archival Documentation) project. One of the aims of the project is to help develop the Transkribus software which will recognise handwritten text. Andrea has marked up almost 100 pages of manuscripts from our collections to teach the system to recognise general page layout and she has also contributed an impressive amount of transcription to enable it to 'learn' Linnaeus's handwriting.

Artefacts: Preservation and Exhibition

Our Curator of Artefacts, Glenn Benson, has begun his sorting and cataloguing of the many and various Society artefacts. These range from a massively heavy lithostone with an image of the skeleton of a two-toed sloth (*RIGHT*), to a small pencil-case purporting to have belonged to Linnaeus, to WWI shrapnel and a bullet from a WWII Spitfire! He has arranged for an expert to provide a proposal for the conservation and display of Linnaeus's herbarium cabinet (*SEE NEXT PAGE*). This work will be carried out in honour of Professor Lucas's 21 years as Treasurer of the

Images: Lithostone, cabinet and library display © The Linnean Society of London

Society. To offer your support, visit **www.linnean.org/Linnaean-Herbarium-Cabinet**

It's been a busy year for Society artefacts in exhibitions: the end of the Tate Britain exhibition *Art and Empire* means that John Lewin's *Thylacine* painting has now been safely returned to the Society. Elsie Brenchley's certificate of recommendation was loaned to Hertford Museum in July for its *Hertfordshire's Hidden Heroines* exhibition, and Robert Brown's microscope will remain as part of *Einstein's Legacy* at the Science Museum until November. We are currently preparing loans to go to the Wellcome Collection exhibition *Making Nature* and to the Martin-Gropius-Bau's *Image Knowledge Gestaltung* in Berlin.

Tours have been popular with a wide variety of specialist groups: volunteer guides from the Cambridge University Botanic Garden; a large group of Chinese tea specialists; Denver Botanic Garden's botanical artists; summer students from Harvard and the University of Maryland; the British Society for the History of Pharmacology; National Trust for Scotland staff and members of the Chartered Institute of Library and Information Professionals (CILIP).

Elaine has created several memorable displays in the Reading Room, particularly those linked to International Women's Day and to the Royal Academy's *Nature and Enlightenment* for the Burlington House Lates programme. In May, a group of youngsters from the Amateur Entomologists' Society's 'Bug Club' attended an event where they made excellent presentations on a variety of insects and afterwards they and their families came up to the Reading Room and had great fun making origami insects—the ladybirds were particularly popular!

Part of the *Nature and Enlightenment* display for Burlington House Lates

Don't forget that the Library Booksale will be held on Thursday 20 October following the evening meeting on *The Feminisation of Nature*.

Lynda Brooks, *Librarian*
lynda@linnean.org

Donations

The following people have made book donations to the Library of the Linnean Society of London. These books will now be in the process of being added to the Society's online catalogue, accompanied by the appropriate donor information.

Thank you to all those who have donated to the Society:

Maria Axelsson

Stuart Baldwin

Professor RJ Berry

Ron den Daas

Gina Douglas

Brent Elliott

Dr Aljos Farjon

Professor Javier Francisco-Ortega

Dr Peter Gasson

Jenny Grundy

Dr Madeline Harley

Dr Zerina Johanson

Christabel King

Linda Locke

Alan W Mallatratt

Susan West Marmagas

Dr Martin Nickol

Michelle Payne

Hugh Pearson

Chris Roome

Carel Sartory

Niki Simpson

Stephen Sutton, Henry Barlow and Terry Whitaker

John R Swift and William G Mattox

Sergio Zagier

The full list of donations is also accessible as a PDF with the online version of this issue of *The Linnean* at **www.linnean.org/thelinnean**.

A printed copy of the list can be sent upon request—please contact the Library staff at **library@linnean.org**.

Joseph Sidebotham:
A minor correction and a note on collaborations

In their paper *Joseph Sidebotham's Lepidoptera* (*The Linnean* 32(1) April 2016), Cook and Logunov express a commonly-held perception that "Doncaster and Raynor (1906) discovered sex-linkage …" (2016 p 11). In fact, the sex-linked transmission of conditions such as colour-blindness and hemophilia in humans had been known for centuries; the collaboration between Doncaster and Raynor provided the first example of sex-linkage that was amenable to experiment.

It also exemplifies a particular kind of collaboration that was formed repeatedly at this time. Gilbert Henry Raynor (1854–1929) was a vicar of the Church of England and a well-known breeder of moths. Whereas Joseph Sidebotham carried out experiments on variation and heritable effects produced by different foodstuffs (Cook & Logunov 2016, pp 10, 11), Raynor was simply an amateur lepidopterist, in search of new or unusual varieties rather than scientific insights. When he bred the *lacticolor* variant of *Abraxas grossulariata* he described the new variant as: "a beautiful pale female, at the first sight of which my rapture knew no bounds. I had never seen a specimen at all like it before …", noting that all the specimens he had seen were female (Raynor 1902). The account attracted the attention of the Birmingham zoologist Leonard Doncaster (1877–1920), who gave a scientific explanation of Raynor's observations, showing that they were consistent with mendelian expectations if *lacticolor* is a sex-linked recessive character (Doncaster & Raynor 1906).

Mendel's researches on inheritance had come to general attention in 1900 and ushered in a period of theory-renewal and frank speculation. Collaborations such as that between Raynor and Doncaster in which 'data-holder-meets-mendelian' provided several tests of the developing mendelian theory. In the following year, Doncaster showed that data published by another amateur lepidopterist, the musician Louis B Prout (1864–1943), exhibited mendelian inheritance in the moth *Xanthorhoë ferrugata* (Doncaster 1907, pp xxi–xxii). The leading mendelian at the time was the Cambridge zoologist William Bateson (1861–1926). In a famous early collaboration, he recognised mendelian heredity in data on the inheritance of alkaptonuria in humans published by the London physician Archibald Garrod (Bateson & Sunders 1902, pp 133–4n).

> "Later the Cambridge agriculturalist Alexander Bruce saw mendelian inheritance in Darwin's data and so originated the 'dominant favourable gene' theory to explain hybrid vigour."

Some of those who provided data for the mendelians to interpret did so posthumously. In a large-scale experiment on hybrid vigour, Charles Darwin had data from cross- and self-fertilisations

of several plant species for which he (and his mathematically-gifted cousin Francis Galton) could find no satisfactory explanation (Darwin 1876, pp 17–18). But later the Cambridge agriculturalist Alexander Bruce saw mendelian inheritance in the data and so originated the 'dominant favourable gene' theory to explain hybrid vigour (Bruce 1910).

In 1868 Darwin had described hybridisations of peloric with normal forms of *Antirrhinum* producing an F_2 generation "consisting of 88 normals, 2 intermediates and 37 perfectly peloric", results that the early mendelians interpreted as showing that pelorism is a mendelian recessive character (Bateson & Saunders 1902, p 125). Bateson was particularly active in 'translating' the research results of others (living or deceased) into mendelian form, and by 1909 he was able to publish dozens of examples of collaborations of this kind in his *Mendel's principles of heredity*.

In the early years of the 20th century there were many sets of pre-existing data that could be tested for mendelian patterns of heredity, but the data-sets had not been constructed for that purpose and were often found to be unsatisfactory in some way, so that the results were what might today be thought of as 'quick and dirty'. Furthermore, the old data-sets were a declining resource as the more suitable of them were translated, and less reliance was placed on them as the results of new, designedly-mendelian, experiments became increasingly available. But collaborations of the data-holder-meets-mendelian kind served an important purpose at the time, giving early evidence of mendelian processes in phenomena such as sex-determination, the inheritance of disease conditions in humans, and hybrid vigour.

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Mike Buttolph FLS
Science and Technology Studies, University College London.
e: m.buttolph@ucl.ac.uk

Image: William Henry Lang portrait courtesy Prof D Edwards

Gender-bending at Rhynie: Some Corrections

> *To kill an error is as good a service as, and sometimes even better than, the establishing of a new truth or fact.*
>
> **CR Darwin FLS (1809–82)**

I wish to correct and update some misinformation presented in an essentially nomenclatural item of correspondence (Pearson 2014). In error I referred to Dr Robert Kidston as FLS and Professor WH Lang as PPLS. Gina Douglas informs me that Lang (Fig 1) was FLS from 1909 to 1939, but Kidston never so. My article also mentioned the meeting of the Linnean Society Palaeobotany Specialist Group at Burlington House on 30 October 2013, held in part to mark the centenary of the announcement of the discovery of the Rhynie Chert (Mackie 1912, 1913). I reported that the centenary of the first resultant publication on the Rhynie Chert flora by Kidston and Lang (1917) was due to take place at the University of Aberdeen during 2017. Professor Dianne Edwards PPLS informs me this is no longer so; instead, a meeting with the same purpose will be held by the Royal Society at Carlton House, London, on 6 and 7 March 2017.

Fig 1 William Henry Lang FLS, (1874–1960), Barker Professor of Cryptogamic Botany in the University of Manchester. With Dr Robert Kidston, Lang described the leafless, vascular plant Rhynia from Rhynie, Aberdeenshire (Kidston & Lang 1917)

It was reassuring, however, to find that my suggested nomenclatural revision for the Devonian gametophyte *Lyonophyton rhyniense* W.& R. Remy had already been proposed by Meyen (1987, p 61). Fourthly, the transverse section of *Rhynia* illustrated in Pearson (2014) was wrongly described as a stem. Morphologically, *Rhynia* lacked leaf/stem differentiation, so the image is of a naked axis. Fifthly, I

wish to thank PM Jørgensen FMLS (2015) for his clarification of the nomenclatural quandary I expressed regarding the gender of the name *Liriodendron tulipifera* L.. However, I disagree with Jørgensen in his view that consideration of the epithet *"…is yet another of those unpleasant irregularities which makes* [sic] *life more cumbersome for modern botanists".* As an extant and *ipso facto* modern botanist myself, I find the requirement to follow the regulations of the International Code of Nomenclature for algae, fungi and plants (ICN; Melbourne Code) neither irregular nor cumbersome. To me, rather, the niceties of the ICN constitute an objective and evolving framework to help botanists, phycologists and mycologists worldwide in their effective use of internationally-acceptable, and comprehensible, botanical names.

"To me, rather, the niceties of the ICN constitute an objective and evolving framework to help botanists, phycologists and mycologists worldwide in their effective use of internationally-acceptable, and comprehensible, botanical names."

Acknowledgements

I am pleased to thank Prof Bill Chaloner PPLS, University of London, for reading and commenting on a draft of this item and to Dianne Edwards for supplying the image in Fig 1. My thanks go also to Mr Roger Pinkney for his photographic help and advice.

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HL Pearson FLS
hlpearson164@btinternet.com

Image: *Cladophora*, Lake Akan, Japan © Flickr/Yu-Chin Lin

Marimo, *Cladophora*, *Posidonia* and Other Plant Balls

Jennifer Bryant and Linda Irvine

Life Sciences, Natural History Museum, Cromwell Road, London, SW7 5BD

e: j.bryant@nhm.ac.uk

We recently came across a short note in *The Linnean* (Brooks 2014) mentioning Marimo. This encouraged us to gather together information on this Japanese phenomenon and other plant balls, especially as the note included the terms 'moss balls' and 'seaweed balls'. These are misnomers as Marimo balls grow in fresh water, are composed of the filaments of a green alga and are known as *Cladophora* balls outside Japan (Fig 1). Moss balls (= *Bryophyta*) are a different entity altogether (Cannon 1985).

The often perfect spheres of sea balls and lake balls are found washed up on beaches and lake shores around the world and, as phycologists at the Natural History Museum, London (NHM), we occasionally received such a ball for identification. Our recent research (Irvine & Bryant 2010) into plant balls was sparked by two articles on algal balls from two localities in Caithness, Scotland, the first on the red seaweed *Spermothamnion* (Scanlan & Holt 2009), the second on *Aegagropila linnaei* (Scanlan 2009).

The two best known kinds of ball are attributable to either the green alga *Aegagropila linnaei* Kützing (= *Cladophora aegagropila* (L.) Trevisan) or to the sea grass, *Posidonia oceanica* (L.) Delile. Well known from the coasts of the Mediterranean and Australia, *Posidonia* balls are formed from the fibres of the basal sheaths which persist after the long narrow leaves have decayed. The fibres become matted together as waves roll them up and down the beach. They can be cast up in large quantities and have even been used commercially (for making paper, stuffing mattresses etc.) and also medicinally. Local names for *Posidonia* balls include the Catalan 'pets de monja' (nun's farts) in the Balearic Islands, 'fibre-ball weed' in Australia and the German 'seeknödel' (sea dumplings).

Fig 1 *Cladophora* or Marimo in Lake Akan, Hokkaido, Japan

Cladophora balls (see John, Whitton & Brook 2011; Guiry & Guiry 2016) are formed from the alga's thread-like filaments which remain photosynthetic and viable, whilst *Posidonia* balls are composed of fibrous remains and are formed 'post mortem'. *Cladophora* balls hit the headlines when one of us (Irvine, writing as Newton, 1950) contributed an article to *The Illustrated London News*. "A beach-ball mystery at Torbay" described the sudden stranding of huge numbers of *Cladophora* balls at high tide level in the southern half of Torbay, Devon, in a 10 foot (3 metre) wide belt, that was 9 inches (22cm) high and over a mile (1.6km) long. With an average diameter of an inch (2.5cm), there must have been over seven million balls in a single layer! As far as we know, nothing like this has been reported before or since in the UK, at least not on a scale to attract public attention, although, recently, sea balls have been newsworthy in the USA (Mathieson, Dawes & Lull 2015).

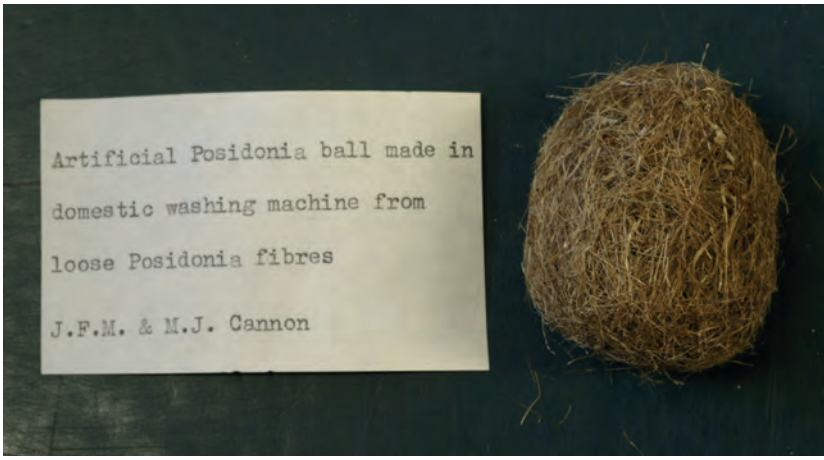

Fig 2 New *Posidonia* ball formed during the normal wash cycle of a domestic washing machine from the fibres of a deconstructed original

Most plant balls have not gained the celebrity of the venerable Marimo of Lake Akan, Japan (Kurogi 1980). The lake has been granted 'Special Natural Monument of Japan' status because of the behaviour of its *Cladophora* balls. Photosynthetic activity causes the balls to bob up to the surface when made buoyant by the gases within. They are part of local culture, fêted by an annual festival, appearing on a post card and a postage stamp. Over-collecting for souvenirs has forced a ban so that there is now a stiff trade in plastic reproductions and in fake balls rolled by hand from the filaments of other *Cladophora* species. Ball formation was thought to be the result of the filaments and fibres being wound together by complex, rolling water movement. This hypothesis was tested convincingly by John Cannon (Keeper of Botany at the NHM, 1977 to 1990), who employed the services of a 'Hotpoint Automatic De Luxe' washing machine and a deconstructed *Posidonia* ball (Fig 2). He scattered the loose fibres into the machine and watched (it was a top-loader) as they were put through several wash cycles. His machine made a typical *Posidonia* ball equal to nature's own and, incidentally, the appliance was none the worse for the experience (Cannon 1985; Cannon 1986).

Keeping *Cladophora* balls as 'pets' is now fashionable and has led to them to being sold via the Internet. To keep them spherical the aquarium water is agitated to simulate the required rolling motion and the filaments are trimmed back when they start to grow out from the ball surface.

Fig 3 A selection of plant balls from the collections at the Natural History Museum. Clockwise from centre front: Ball of *Cladophora* (more correctly *Aegagropila linnaei*) filaments mixed with larch needles from Malham Tarn, Yorkshire; *Cladophora* ball cut in half to show the hollow centre; large *Cladophora* ball from county Clare, Republic of Ireland; *Cladophora* balls from south Devon beaches (shown in front of and beside their contemporary storage tin); two *Posidonia* balls from Tunisia; Japanese postage stamp showing *Cladophora* balls in the waters of Lake Akan, Japan

An example of a ball being both living and dead is the *Cladophora/Larix* ball formed when *Cladophora* filaments entangle the needles fallen from larch trees lining the water's edge (Fig 3). The balls thus formed are compact, dark brown and spiky and have been known to reach the size of a football. Those fished out of lakes formed by the meandering river Inn near the village of Sils-Maria, Switzerland, have been emulated by local confectioners. Their likeness made from marzipan and coated with chocolate may be seen alongside the real thing in the local shop windows (J Smith, pers. comm.). Other moribund plant materials recorded in ball formation are the bark fibres of *Sequoia* and the root fibres of marram (*Ammophila arenaria* (L.) Link) (Cannon 1986).

Balls of coralline (calcified) algae, commonly known as 'rhodoliths', are fairly well known (Irvine & Chamberlain 1994). They result when the alga grows as a nodule around a hard core (*eg* small stone) or when branches live on independently after becoming detached. Moderate water movement turning the branches over and over is enough to create the rhodolith balls. Experiments with models and specimens in wave tanks (Bosence 1983) showed that ellipsoidal forms are more easily transported than spheroidal forms, whilst discoidal forms are the most stable. Rhodoliths are known from the Poles to the Tropics in non-muddy marine environments and up to at least 100 metres deep. In the British Isles they occur in the west of Ireland and in Falmouth Harbour (Irvine & Chamberlain 1994). They provide a diversity of niches which support a wide range of plants and animals. Living rhodoliths have been shown to be up to tens of thousands of years old and provide a long term record of seafloor conditions.

For more information on a range of ball-forming taxa, with extensive bibliographies, see: Mathieson, Hehre & Dawes (2000); Mathieson, Dawes & Lull (2015).

Balls examined in the herbarium collections at the NHM show that those made solely of freshwater *Cladophora* filaments are usually hollow, whilst the *Cladophora/Larix*,

Posidonia and marine *Cladophora* balls are solid. The many examples at the NHM demonstrate that these balls have always been much admired for their scientific and curiosity value. The earliest *Cladophora* ball in the collection is part of the Reverend John Lightfoot's herbarium, *c.* 1770, and has been threaded on a string (Fig 4). Perhaps it was a plaything for his infant son (Bryant, Irvine & Ruffle 2012).

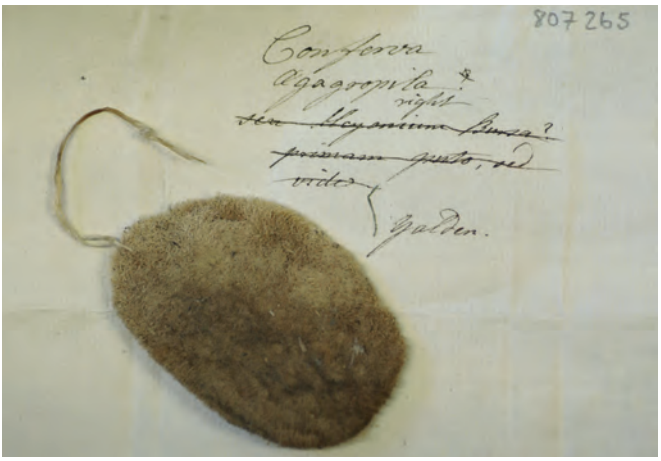

Fig 4 *Cladophora* ball, threaded on a string, from the herbarium of the Reverend John Lightfoot, c. 1770, now in the NHM

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Dr Alexander Gibson Museum: India Commemorates a Linnean Fellow

Dr Satish A Pande MD DNB PhD FMASci FLS

Director, Ela Foundation
C-9, Bhosale Park, Sahakarnagar # 2
Pune 411009, Maharashtra, India

e: pande.satish@gmail.com

Dr Alexander Gibson FLS (1800–67), the first conservator of forests of the Bombay Presidency in India, and a proud son of Scotland, connected two great nations. He tirelessly strove to protect and augment India's forest wealth. As a conservator he introduced silviculture and laid the foundations of 'Participatory and Social Forestry'. He also emphasised the effect of forests on hydrology and climate and experimented in economic botany, pharmaco-botany and the improvement of agricultural crops. He collected herbarium specimens, wrote books and scientific papers on forestry and pharmaceutical-botany, discovered new plant species, encouraged local people to plant trees and started a library in a village to make natives aware of horticulture and the science of botany. In India the contributions of Gibson were almost entirely forgotten for over 177 years. I first came across the name of Gibson while reading the history of Indian Forestry by EP Stebbing (1922), and was drawn to him as he was not only a conservator, but also a medical doctor (like myself). This interest led me to the work of Dr Henry Noltie of the Royal Botanic Garden Edinburgh (RBGE); in July 2014, I was able to visit Britain, where Henry took film-maker Kiran Ghadge and myself around various places connected with Gibson, whose life he had extensively researched. Back in India this quest culminated in two major projects: a documentary on the life of Gibson (a copy of which has been deposited in the Linnean Society), and the creation of a museum dedicated to him at Hivre in Maharashtra State (Fig 1). This museum was

Fig 1 The Dr Alexander Gibson Museum in Hivre, Maharashtra State

commissioned by the state Forest Department and is the only museum dedicated to an individual British forest officer.

Alexander was born to William Gibson and Rachel Bruce on 24 October 1800 and was baptised at Laurencekirk, Kincardineshire. He spent his early childhood in the Scottish countryside, where he developed a love for nature, learned agricultural improvement skills from his farmer father, and also the principles of religious tolerance. His schooling was at Montrose Academy, from where he went to Marischal College, Aberdeen (1812–16) to study Latin, Greek, Humanities and Natural History. At the University of Edinburgh (1818) he studied *Materia Medica* and anatomy, and attended the botanical lectures of Professor Daniel Rutherford (discoverer of nitrogen).

Immediately after obtaining his license from the Royal College of Surgeons of Edinburgh, Alexander made two voyages to India (1820–22 and 1822–24) on the East Indiaman *Royal George* and the Cruiser *Discovery*. In 1825 the East India Company (EIC) appointed Gibson as an Assistant Surgeon. He served in the first Burmese War, and as Flag Surgeon was honoured with the 'Ava Medal' for his medical services. Gibson's next posting (1827) was in India, to Matunga, Bombay, as Assistant Surgeon to the Bombay Horse Artillery. Gibson interacted with the 'Bheels' and other natives over the 'mowha' or 'madooka' tree (*Madhuca longifolia*) whose flowers are harvested for making liquor. Gibson was fluent in Marathi, Gujarati and he also knew Hindustani. This flare for languages proved useful when he was appointed Vaccinator in Gujarat, Kokan and the Deccan. In 1837 the EIC appointed Gibson to be Superintendent of District Gardens (Hewra, Neergoodi and Sheeoneri). The nearby Western Ghats around the village of Junnar probably reminded Gibson of the mountain country in Scotland.

In 1838, Sir Robert Grant, the Governor of Bombay, appointed Gibson as Superintendent of the Dapuri Gardens, Poona, which doubled both as a botanic garden and as a vegetable garden for the summer residence of the Governor. There, Gibson made trials on pharmaceutical-botany and the improvement of crops, travelling between the gardens at Dapuri and Junnar. When, one night in 1839, dacoits attempted to rob his house at Junnar, the local people came to his assistance, attesting to his local popularity. The same year Gibson sent models of agricultural implements to the Museum of Highlands and Agricultural Society of Scotland. These models are now in the Museum of Rural Life at East Kilbride (National Museums of Scotland) and included a bullock cart, hoe, seed drill, ploughs, mattock, sickle and trowel.

Fig 2 Sir William Jackson Hooker

Gibson corresponded with Sir William Jackson Hooker (Fig 2), Director of the Royal Botanic

Gardens, Kew (RBGK) and these letters, preserved in the archives of the Directors Correspondence at Kew, form one of the most important biographical sources about his time in India, revealing his administrative challenges and other interests. Gibson also sent Hooker herbarium and museum specimens, including blocks of timber samples, which are still in the Economic Botany Collection. In Hooker's herbarium are specimens collected by Gibson, including the types of several species named after him, including *Croton gibsonianus* described by J Graham, and *Barleria gibsonii* named by NA Dalzell.

In the 1840s alarm bells were ringing in India and Britain due to an acute shortage of timber for shipbuilding. In 1840, because of his knowledge of botany, the Bombay Government ordered Gibson to examine the forests tracts of the northern Western Ghats for the Marine Department. Gibson observed extensive tree felling and saw huge tracts of "barren and sterile land". Two years later he wrote that "natives were ready enough to fell a tree but slow to plant one". Wood was required as fuel, for civil works, and making poles, gun carriages, rifles, fans, agricultural implements and wheels. Large forests tracts were clear-felled. In his 1845 Forest Report Gibson confirmed the fears about timber shortage and wrote that "there was no timber available for ship building". In his opinion the forests needed urgent management. He cautioned the Government against leaving forests in the hands of the people and stressed the need for regulation and the control of indiscriminate felling.

"In 1842, Gibson introduced the practice of silviculture and gave wood obtained from the lopping and thinning of forests for the use of locals. By doing this, he won the confidence of village heads, including Khots, Kamvisdars, Patels and Kulkarnis, thereby laying the foundations of 'Participatory and Social Forestry' in India."

In 1842, Gibson introduced the practice of silviculture and gave wood obtained from the lopping and thinning of forests for the use of locals. By doing this, he won the confidence of village heads, including Khots, Kamvisdars, Patels and Kulkarnis, thereby laying the foundations of 'Participatory and Social Forestry' in India. The Government took note of the report on the alarming state of forests of the north Konkan and in 1845 Gibson was appointed 'Interim Conservator of Forests', confirmed two years later as the first Conservator of Forests of the Bombay Presidency. During the wet, monsoon months Gibson would write up reports on the findings from his four-to-six-month surveys, undertaken on horseback during the dry months. He was a man of iron constitution and a loyal servant of the Government.

In 1847 and 1849 Gibson employed an anonymous Portuguese artist for a total of 26 months at a monthly salary of Rs. 20 (when his own monthly salary was Rs. 1124) to draw 173 plants from the Dapuri and Hewra Gardens. The drawings are preserved at RBGE. A treatise on these drawings was published by Henry Noltie in 2002. Gibson's own publications included *Forest Reports* (1849–50; 1855–60), *Garden Reports* and over 48 papers on economic and ethno-pharmaco-botany of India and several books that show his practical and academic interests. He published in *Journal of the Agricultural and Horticultural Society of India*; the *Transactions of the Agri-Horticultural Society of Western India* and elsewhere. In 1845 Gibson started a library at Hewra so that the native youth could develop an interest in botany, thereby providing "the advantages of a garden, extensive Herbarium, and books of reference within 44 miles of the railway station at Tulegaum" (now Talegaon).

On 19 April 1853 Gibson was elected a Fellow of the Linnean Society of London. He was proposed by Sir William J Hooker, Thomas Thomson, Joseph Dalton Hooker, John J Bennet and Robert Bentley; the President at the time was Robert Brown. During his time in India, Gibson had an opportunity to interact with several distinguished contemporaries, including Dr Hugh Cleghorn (1820–95), who in 1856 was appointed Conservator of Forests of the Madras Presidency. Like Gibson, Cleghorn and Edward Balfour believed in the influence of forests on hydrology and climate. Other interesting links were with Sir Joseph D Hooker (1817–1911); the great orientalist Captain (later Sir) Richard Burton ([1821–90], whom he requested to collect samples of gum in Somalia in 1864), and, briefly, with Sir Dietrich Brandis (1824–1907), who was later appointed as the first Inspector General of Forests, India.

In herbaria and archives Gibson's memory has lived on in plant names and in the Dapuri Drawings at RBGE. But there are also living memorials: a mahogany and several banyan trees almost certainly planted by Gibson at the Hewra (now Hivre) Garden

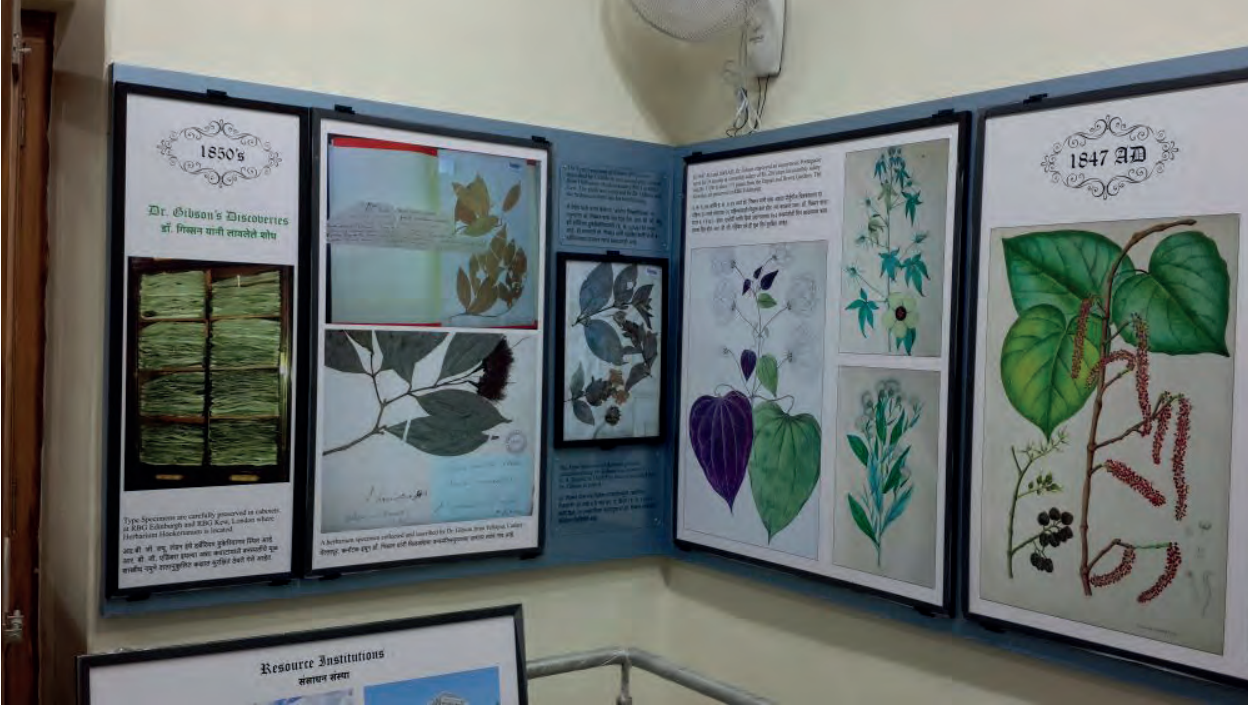

Fig 3 *(Below Left)* Panels in the museum, with bilingual captions in English and Marathi; **Fig 4** *(Above)* View of interior of the museum.

in India, and giant redwood trees (*Sequoiadendron giganteum*) planted by him at Auchenreoch in Scotland. In his will he specified that "it shall not be lawful to the said heirs of Entail to cut down wood within the policy attached to the Mansion house unless in the course of necessary management"—if this were breached the estate would pass to the next heir! An architectural survivor is the stone monument built by Gibson (for reasons unknown) which still stands majestically above the now flooded garden at Hivre. Beside it are memorial stone slabs inscribed in Latin by Dr Gibson to three of his pet dogs. The inscriptions can be translated as: "Hector, energetic, strong and faithful, 1841"; "Tippoo, companion of nine years, 1846"; and "Lazy."

After retirement Gibson returned to Auchenreoch, Scotland and lived in the house that he had inherited from his brother in 1858. He breathed his last there on 16 January 1867 and was buried, during a snowstorm, five days later, joining the mortal remains of his sister Jane and brother Archibald in Stracathro Kirkyard. Obituaries were published in the *Proceedings of the Linnean Society of London*, *The British Medical Journal* and in a local Montrose newspaper. However, his demise went unnoticed in India.

The name of Dr Alexander Gibson was never quite forgotten in Scotland. The name of this first Conservator of Forests in India was included as a notable local figure in a contemporary history of Montrose (Mitchell 1866) and his contribution was recently included in the Scottish Diaspora Tapestry. With the release of the documentary and establishment of 'Dr Alexander Gibson Museum' at Hivre, Maharashtra, in 2016, India has now also remembered one of her forgotten Scottish sons.

The Museum is located close to the site of Gibson's Hivre garden, having a five-acre campus in the Pune district of Maharashtra. The larger part of the garden was

submerged in the backwaters of a dam on the Kukdi River built in the early 1970s for irrigation purposes. The Museum, commissioned by the Maharashtra Forest Department and executed by the Ela Foundation, is housed in a small bungalow constructed in 1910. The central hall is 17.6 x 14.7 feet, with side rooms flanking the hall each of 14.7 x 11.7 feet. At the rear is a projection room where the documentary on Gibson will be screened, and the outer verandah has a further five exhibits. The exhibits (Figs 3 & 4) include 32 wall mounted aluminum composite panels of various sizes ranging from 22 x 44 inches to 147 x 44 inches, on which 144 colour and black and white matt laminated photographs are mounted in weather-proof polyvinyl frames. The rooms are illuminated by LED roof-mounted exhibition lamps. Sadly no photograph of Gibson is known, so he can be represented only by exhibits representing his outstanding life and work (Fig 5). These include images of the places where Gibson studied in Scotland, his work as Superintendent of the District Gardens and as Forest Conservator, his publications, his Linnean Society Fellowship, people with whom he interacted, representative herbarium specimen, the models of agricultural implements sent by him back to Scotland, some of his letters, maps, covers of his books, some of the Dapuri Drawings, and of his final home of Auchenreoch and his grave at Stracathro.

Fig 5 The opening panel of the Dr Alexander Gibson Museum

Acknowledgements

Special thanks are due to Dr Henry Noltie, RBGE. This account relies heavily on his work and he was instrumental is facilitating permissions for display material for the Gibson Museum: these were kindly given by the RBGK, RBGE, the Linnean Society of London, Museum of Rural Life, National Museums of Scotland at East Kilbride and the British Library, London. Other material has kindly been provided by the Maharashtra Forest Department, the Forest Research Institute, Dehradun, the Ela Foundation, Pune and the Asiatic Society, Mumbai. Research and Script for the museum is by Dr Satish Pande FLS. The Museum concepts are due to Ashok Sharma IFS; Dr AK Jha IFS; Jeet Singh IFS; Nitin Kakodkar IFS and SP. Execution was by Sanjay Khatavkar (who also enacted the role of Dr Gibson in the documentary), Kaustubh Mudgal and SP; with photography by Kiran Ghadge and SP, and design by Kiran Velhankar.

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Images: Museum panel courtesy Dr Satish A Pande/John White portrait courtesy of Gorringes of Lewes

Dr John White FLS Surgeon-General of New South Wales: A Portrait by Thomas Watling

E Charles Nelson FLS

Tippitiwitchet Cottage, Hall Road, Outwell, Norfolk PE14 8PE

e: tippitiwitchet@phonecoop.coop

The Irish-born naval surgeon John White (c. 1756–1832) was one of the senior officials of the penal colony established in New South Wales in 1788 (Nelson 1998b). His *Journal of a voyage to New South Wales* (White 1790) contained some of the earliest published representations of the Australian flora and fauna (Chisholm 1962; Nelson 1998a; Pigott 2000). Having served for six years in the colony, White was allowed leave to depart and he returned to Europe reaching London on 29 July 1795. On 19 January 1796, having been nominated by Aylmer Bourke Lambert, John Symmons and James Dickson, White was elected a Fellow of the Linnean Society of London. The Senate of the University of St Andrews conferred the degree of Doctor of Medicine on him on 10 March 1797.

Until recently the only portrait known of Surgeon-General White was as an unidentified individual among a group of medical officers depicted in the watercolour no. 25 by an anonymous artist contained now in the so-called 'Watling Collection' held in the Natural History Museum, London (Nelson 1998b: figure 9). The painting is entitled "Mr White, Harris, & Laing with a party of Soldiers visiting Botany Bay Colebee at that place where wounded near Botany Bay". It has been suggested (Rienits 1962, see Chisholm) that White is the central figure, dressed in white breeches, a pale fawn jacket with stand-up collar and a wide-brimmed pale hat.

In 4 December 2007 (sale LDEC07 lot 2026), the auctioneers Gorringes of Lewes, Sussex, auctioned as a pair a "tassie type plaque" of Admiral Lord Nelson with a miniature portrait of Surgeon-General White. The estimate for the pair was £3,000–£5,000 (Gorringes 2007) but only £200–£400 for the miniature (Shelton 2007), yet the hammer price for the portrait of White, after more than 400 bids, was £90,000 (US$165,532) (Shelton 2007, Murray 2008). The unframed miniature, in oil on an oval ivory disc, is signed "T.WATLING

pinxt". Thomas Watling (1762–c. 1814), convicted of counterfeiting and sentenced to 14 years' transportation, arrived in New South Wales on 7 October 1792. The portrait has since the auction attracted the attention of a few art historians and bloggers, but does not appear to have gained the notice of historians of natural history.

The authenticity of the miniature seems incontestable: according to the auctioneers, the sitter's name and rank was "delicately painted onto a piece of paper attached to the back of the miniature" (Gorringes 2007).

Watling depicted White 'warts and all'—this is not a studio portrait of an important Georgian naval officer in neat, powdered wig and dress uniform. White's long, sun-bleached natural hair is disheveled; his forehead is pale whereas his cheeks and lower face are reddened with sunburn and there is a distinct demarcation between his sunburnt skin and that above which was very probably protected by a wide-brimmed hat. The sitter wears a dark blue jacket with broad lapels over a white shirt with ruffled front. Interestingly, the stand-up collar of the jacket is red, and that accords with the description of the uniform worn by a naval surgeon who served in the West Indies in 1795, although before 1805 naval surgeons did not have an officially sanctioned uniform (Lloyd and Coulter 1961; Nelson 1998b: 201 n108). Murray (2008) commented that the miniature was "not the finest quality, and it's not an attractive face, though full of character". Watling (1794) himself, in a letter to his aunt written from New South Wales, recorded that "My employment is painting for J. W____, esq. … The performances are, in consequence such as may be expected from genius in bondage to a very mercenary, sordid person". His portrait of White, unflattering as it is, seems to reflect Watling's disdain for his subject.

My thanks to Clifford Lansberry of Gorringes for supplying the digital image. The present whereabouts of the miniature is not known.

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Who First Discovered Devonian Fossils at Rhynie?

Hugh L Pearson FLS

Applecraft, Abbey Road, Leiston, Suffolk IP16 4RE

e: hlpearson164@btinternet.com

> *"False facts are highly injurious to the progress of science, for they often endure long; but false views, if supported by some evidence, do little harm, for every one takes a salutary pleasure in proving their falseness."*

Charles Darwin, 1871 *Descent of Man,* Vol 2, Chapt 22, General Summary, p 385

The richly fossiliferous, Lower Devonian cherts found near Rhynie, Aberdeenshire, have received many positive superlatives in accounts of their early terrestrial plants, animals, fungi and prokaryotes over the past century (*eg* Chaloner & MacDonald 1980). Naturally, some centennial interest will rest upon exactly when, where and by whom the Devonian biota of Rhynie were first found. I followed Kidston and Lang (1917) in crediting William Mackie of Elgin with the chance discovery and recognition of *ex situ* blocks of Rhynie Chert in stone walls ("dykes") or scattered over the fields near Windyfield farmhouse, *c.* 1km northwest of the village of Rhynie (Cleal & Thomas 1995). However, in his comprehensive account of the history of Rhynie Chert studies, Trewin (2004) referred to three 19th-century reports of further Lower Old Red Sandstone (*ie* early Devonian*)* specimens described as, or compared to, fossils that had been collected at Rhynie around 60 years before Mackie's report on his discovery of the Rhynie Chert:

1) Hugh Miller, the celebrated field geologist of Cromarty, published an account of fossil plants found in the Lower Old Red Sandstone in the vicinity of Rhynie. In his posthumously published lecture 'On the less known fossil floras of Scotland*',* Miller (1857, p 435) stated:

> *I may here mention, that curious markings, which have been regarded as impressions made by vegetables that have themselves disappeared, have been detected during the last twelvemonth* [*ie* 1854–55] *in a quarry of the Lower Old Red Sandstone, near*

Huntly, by the Rev. Mr. Mackay of Rhynie. They are very curious and very puzzling; but though some of the specimens present the appearance of a continuous midrib, that throws off, with a certain degree of regularity, apparent leaflets, I am inclined to regard them as lying within the province of the ichnologist than the fossil botanist. They bear the same sort of resemblance to a long, thickly-leaved frond, like that of the "hard fern" [the extant *Blechnum spicant* (L.) Roth.] *that the cast of a many-legged annelid* [*sic*] *does to a club-moss; and I was struck, on my first walk along the Portobello beach, after examining a specimen kindly sent me by Mr Mackay, to see how nearly the tract* [*sic*] *of a small shore crab (*Carcinus Moenas*) along the wet sand resembled them, in exhibiting what seemed to be an obscure midrib fringed with leaflets.*

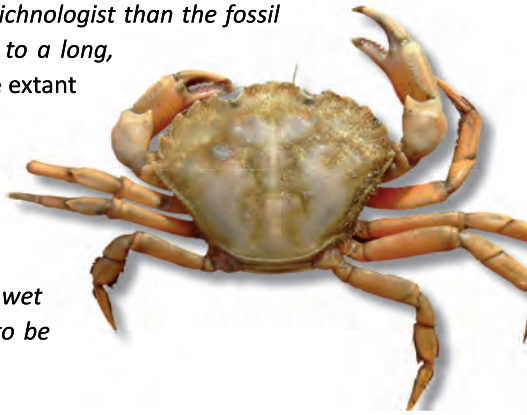

Fig 1 Sir Roderick Impey Murchison from *Vanity Fair* (1870)

2) Sir Roderick Impey Murchison (Fig 1), Director of the Geological Survey of Great Britain, 1855–71, also reported on these specimens that had been collected by Mackay and shown to Miller; Murchison (1859, p 432) followed Miller in comparing them to the tracks of a crustacean.

3) The Revd Alexander Mackay, first Free Church minister at Rhynie, gave the following account of the specimens he himself collected there:

…discovered a large calamite [*sic*] *in an Old Red Sandstone quarry of the* Lower Formation *at Rhynie, Aberdeenshire, previously regarded as unfossiliferous. Near it were found curious fern-like markings of great beauty, which Sir Roderick Murchison regards as "impressions made on the sand by the pectoral fins of fishes swimming in shallow water*". (Mackay 1861, p 44).

Before commenting further on these specimens, collected at Rhynie in the 1850s and variously compared by three contemporary authors to two classes of plants and three phyla of animals, may I note that Trewin (2004) also drew attention to the discovery of a supposed fossil plant from the Old Red Sandstone at Rhynie that had been reported earlier than Mackie's note of 1912. Newlands (1911) stated:

…the author recorded a plant fragment 4 feet 2 ½ inches [*c.* 1.28m] *long from a freestone quarry at Rhynie. The specimen was a cast in sandstone, and the surface features were described, but no name given to the fossil as it was too imperfectly preserved. Photographs of the plant were exhibited, and attention drawn to a similar specimen mentioned in Memoir on Sheet 76 of the*

Images: *Carcinus moenas* from WikiCommons/ Hans Hillewaert; Sir RI Murchison © Linnean Society of London

Geological Survey of Scotland. This last example had been obtained in 1854 in the Rhynie quarry by the Rev. A. Mackay, and presented by him to the Museum of Practical Geology, London. Mr. Newlands further intimated that his specimen had been placed in the Geological Museum, Marischal College Aberdeen.

Trewin (2004) identified Newlands's sandstone cast as specimen AUGD12478 in the Geology Museum collections at the University of Aberdeen. This rock was traced to having possibly come from the Quarry Hill Sandstone, near Glenbogie, SW of Rhynie village; Grid Ref. NJ488256. Indeed, research by Carroll (1991 unpublished Ph.D, thesis, University of Aberdeen) has located specimens of the trace-fossil *Diplichnites* from that very quarry in Lower Old Red Sandstone, *c.* 2.15km south of the Rhynie Chert itself. Trewin commented that Newlands's specimen has been closely compared to that morphotaxon. However, it should be noted that there are other disused quarries in the Old Red Sandstone within a 4km radius of the Rhynie Chert (*eg* Kirkney Quarries between Rhynie village and Huntly; around Grid Ref. NJ504317) where Mackay and/or Newlands might have obtained their specimens.

"It seems to me indisputable that William Mackie was indeed the chance discoverer of the Rhynie Chert in the period 1910–14, when he was mapping the geology of that part of Aberdeenshire."

It seems to me indisputable that William Mackie (1912, 1913) was indeed the chance discoverer of the Rhynie Chert in the period 1910–14, when he was mapping the geology of that part of Aberdeenshire. However, if one takes a wider perspective, it is clear too that a number of reputable, 19th-century geologists had reported fossils from the Lower Old Red Sandstone within a few kilometres of Rhynie village. In his much-quoted description of the early Devonian plant *Psilophyton,* JW Dawson (1859, p 482) made the following observations, remarks and prediction which have a bearing on the discoveries made at Rhynie:

When broken into fragments and imperfectly preserved, Psilophyton princeps *presents a variety of deceptive appearances. When perfectly compressed in such a manner as to obliterate the marking, it might be recorded as a dichotomous fucoid or a flattened root. When decorticated and exhibiting faint longitudinal striae, it presents, especially when the more slender branchlets are broken off, the aspect of a frond of* Schizopteris *or* Trichomanites [Carboniferous pteridophylls of supposed schizaeaceous and hymenophyllaceous affinities respectively]. *When rendered hollow by decay, it forms bifurcating tubules, which might be regarded as twigs of some tree with the pith removed. Lastly, the young plants might be mistaken for ferns in a state of vernation. In all conditions of preservation, the stems, rhizomes and rootlets, if separated, might be referred to distinct genera. I have little doubt therefore that many imperfectly preserved Devonian plants of this general form* [*ie* like *Psilophyton* Fig 2] *noticed under various*

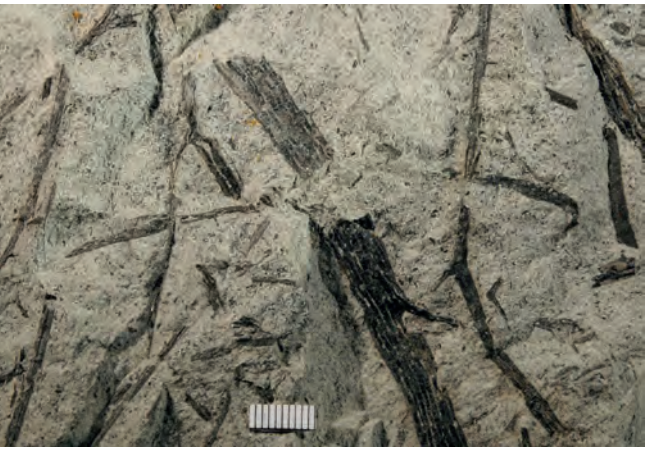

Fig 2 *Psilophyton princeps*

names by authors, may belong to this genus, and some of them to the species above described. In particular I may refer to ...the bifurcating plants with curved tendril-like branchlets figured by Hugh Miller,"Old Red Sandstone," plate 7, and "Testimony of the Rocks," p. 434. From the description in the former work, Chap. 5, it would appear that the author had observed not only the stems but the rhizomes with their stigmatic-like areoles, though without suspecting them to belong to the same plant. I have little doubt therefore that materials exist in the Old Red Sandstone of Scotland for the reconstruction of at least one species of this genus.

Notwithstanding the criticism that Dawson's diagnosis, typification and reconstruction of his new genus *Psilophyton* confusedly included also material from two non-trimerophyte genera (Kenrick & Crane 1997), it is evident that he was taking account of observations made in the 1850s of early Devonian plants from Scotland (and in German states) in constructing his famous concept of an early, leafless, vascular, land plant. Having referred directly to p 434 of Miller's *Testimony of the Rocks"* (Miller 1857), one cannot imagine Dawson had not read on the next page about Mackay's discoveries near Rhynie. It is disappointing, of course, that neither Miller, Murchison nor Mackay himself provided illustrations of the specimens collected from a quarry at Rhynie in 1854; perhaps that is why Dawson did not refer to them in the way he noticed some of the other Devonian plants that Miller had illustrated from Cromarty and Thurso. Or maybe Dawson was influenced by Miller's and Murchison's interpretations of them as animal tracks or traces, not plant fossils. It is clear, nonetheless, that Dawson (1859) realised that Devonian plants resembling his *Psilophyton* might both already have been found and would yet be discovered in the Old Red Sandstone of Scotland. As Taylor and Smoot (1984, p.59) commented regarding Dawson on *Psilophyton*:

> *It is unfortunate that this important paleobotanical discovery went relatively unnoticed for nearly 60 years until the description by Kidston and Lang of vascular plants from the Devonian of Scotland appeared in 1917.*

Taylor and Smoot went on to describe Dawson's prediction of further discoveries of relatively simple, vascular, land plants in the Old Red Sandstone of Scotland as having been "*almost visionary when seen in relationship to Kidston and Lang's later work".*

In conclusion, where do these historical observations leave us in relation to the palaeobiology of the Devonian biota of Rhynie? Whilst the amazing quality of preservation of some of the earliest terrestrial organisms in the Rhynie and Windyfield Cherts will probably remain the main focus of next year's meeting at the Royal

Society, let us not lose sight of the 'bigger picture' for that *Konservat-Lagerstaette.* By considering the fossils (and perhaps pseudofossils) that were found in quarries near Rhynie in the 19th century, plus any potential new specimens awaiting discovery there or in their vicinity, I predict that we might open up new avenues of research to cast more light on how life invaded the dry land about 400 million years ago.

Acknowledgements

I am pleased to thank Professor Bill Chaloner PPLS, Royal Holloway, University of London, for reading and commenting on a draft of this item.

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Jim Green (1945–2016): Professor Jim Green, who passed away in January, was a remarkable biologist—quiet, humble and unassuming with many facets to his passion for understanding the natural environment. Fundamentally a zoologist, his expertise embraced subjects ranging from aquatic biology and taxonomy to ornithology and the interactions of organisms in foodwebs and ecosystems. Internationally he was best known for his studies on freshwater zooplankton communities in ecosystem dynamics. He was a great traveller and rarely missed an opportunity to visit research institutions and work with students and local scientists in some of the most challenging environments in the world.

After 12 years on the staff of Bedford College, in 1964 Green was appointed Reader in Zoology at Westfield College and in 1968 was awarded a DSc. (London). In 1969 he was promoted to Professor under the Headship of Professor Joe Webb and in 1980, on the retirement of the latter, he took over as Head of Department. The 'Westfield' period was a time of exploration, inspiration and scientific production by Green; indeed, probably the happiest period of his academic life. In the early 1980s Westfield College in North London was closed, and in 1984 amalgamated with Queen Mary College in East London. This upheaval was unsettling for all and Green never really settled down comfortably again. He retired in 1992.

Green was a loyal member of over 15 Learned Societies and attended meetings as an active participant. His Fellowship of the Linnean Society of London was a favourite as it emphasised taxonomy. He was elected Fellow to the society in 1969 and served on Council from 1975–79 and 1986–94, and was Zoological Secretary from 1988–94. He was Vice-President twice and was an important contributor to society activities throughout.

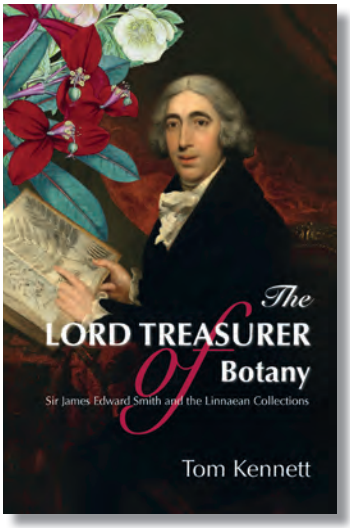
What is his legacy? His gentle wisdom moulded many a career and/or hobby and provided a life-long curiosity for the intricacies of the natural environment. Green's strength was as a traditional biologist that provided a solid foundation for contemporary thinking. He was above all a taxonomist, collector, explorer and cataloguer with a passion for understanding Nature, especially in freshwater ecosystems. He believed that a basic knowledge of taxonomy, and the form and functioning of organisms was a cornerstone for biological understanding. He deplored the decline of these disciplines in many curricula today.

His publications provide a record of the status of waterbodies from a wide diversity of localities over a period of 60 years. His sample collection, all carefully preserved and labelled, must be second to none and it is hoped this will find a permanent home in an appropriate repository.

He is survived by Mary, his wife of 65 years, his daughters Rachel and Helen, six grandchildren and two great-grandchildren.

(Edited from Professor Patrick Denny's unpublished submission for The Times*. There is also a link on FSC stories: see* http://www.field-studies-council.org/about/fsc-stories/1940s/1949-jim-green.aspx*)*

The Lord Treasurer of Botany: Sir James Edward Smith and the Linnaean Collections



Tom Kennett

388pp., London: The Linnean Society of London, 2016, flexibound. ISBN 976-0-9935510-0-0

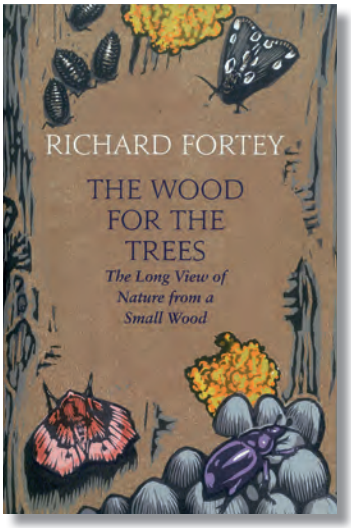
Although involved in initial discussions for cataloguing and digitising the Smithian correspondence at the Linnean Society of London, the content of this book remained something I knew nothing of in any detail until I received my print copy, so I can legitimately review it impartially. Tom Kennett has managed to bring together a readable and definitive life of James Edward Smith, expanding substantially on the slim volume Margot Walker produced for the Linnean Society Bicentenary in 1988.

Kennett's role in cataloguing the Smith correspondence has enabled him to flesh out the personalities that mentored and supported Smith in his rise from a schoolboy 'botaniser' in Norwich to fully established professional, known throughout Europe and the Americas as the holder of the Linnaean Collections. Citations to the letters throughout the text, and their online accessibility, enable a reader to explore further. Kennett deals well with the controversial issues, such as Smith's radical views expressed in his published *Tour of the Continent*, as well as the quarrel with Richard Salisbury and Smith's attempts to be appointed to the Cambridge post for the Professor of Botany. Insight into Smith's close friendship with Edmund Davall and Smith's married life are, of necessity, limited to the resources available, Pleasance Smith having edited her husband's letters before presenting them to the Society. Until, and if, any new resources become available, this will remain the definitive source on JE Smith, with the 34 pages of Notes and the ten page Bibliography providing resources for those interested in following up on specific matters.

The 26 coloured illustrations include portraits of key people and images from publications with an additional unlisted 35 black and white illustrations in the text, which include more portraits, manuscript extracts, key places and maps, including some specially commissioned drawings. A 'Cast of Characters' gives brief biographies of key people and a 'Timeline' summarises Smith's life, within the framework of events from the birth of Linnaeus in 1707, to the Society's move to its present accommodation in Burlington House, Piccadilly. The 26 page Index is comprehensive and the soft cover, with fold-overs which can be used as bookmarks, shows the Chantry portrait of Smith and the landscape of Hafod. The binding appears robust and handles well, so it should be a lasting resource which opens up new insight into a much wider subject area than either Smith or the Linnean Society of London, as well as being an enjoyable text to read.

Gina Douglas, *Editor*
gina@linnean.org

The Wood for the Trees: The Long View of Nature from a Small Wood



Richard Fortey

306pp., London: William Collins, 2016, hardback.
ISBN 978-0-00-810466-5

Trees seem to be the veteran darlings of nature writing. This should come as no surprise; trees and forests are vital for life as we know it, providing food, fuel, building material, paper… and, of course, oxygen, water, soil retention and much more.

A flurry of new publications joins a long tradition which arguably started with John Evelyn's *Sylva* in 1664 and included some of the most beautiful (and useful) nature books written in Britain, such as Jacob George Strutt's *Sylva Britannica* (1826) with lively "character-sketches" of particular remarkable trees, or Henry John Elwes's magnum opus *Trees of Great Britain and Ireland* (7 volumes, 1900–03), which described every species of tree grown outdoors in Britain by showcasing individual prime specimens.

More recent favourites include the sumptuously produced *The New Sylva* (Hemery and Simblet, 2014) and Max Adam's eclectic-reflective *The Wisdom of Trees* (2014). While many of the more recent publications seem to draw on the well-established pattern of describing practical uses of trees alongside their beauty, they also celebrate them as guardians of an increasingly threatened biodiversity.

It seems to have become almost a must for current authors to actually own a piece of woodland. A strong political and socio-psychological note was added to the canon in Richard Mabey's *Beechcombing* (2007), where he describes the trap of wanting to be an owner of a woodland in order to "care" for it. To care, he says, is "a treacherous emotion, apt to slip into a sense of custodianship, and then of possessiveness, into a habit of seeing the natural world as not just in need of protection, but unable to thrive without our help".

Richard Fortey's *The Wood for the Trees: The Long View of Nature from a Small Wood* was triggered by buying an area of ancient beech and bluebell woodland in the Chilterns. So does he fall into this trap? It does not seem like it. With a keen naturalist's eye (Fortey is a retired senior palaeontologist) and insatiable curiosity, he treats his woodland more like a giant multi-layered specimen, probing and examining it from all angles. Roping in leading experts in their fields, he gives the reader a scientifically sound yet highly approachable tour through the complexities of this formidable ecosystem. The human factor is treated as equally important;

instead of just writing about the long history of the native uses of woodlands, he rolls up his sleeves and organises digs, fellings, woodturning, tile and glass making—to name but a few.

All of this is complemented by the local history of the area around the woodland, yet it is these interwoven passages which seem slightly out of tune with the rest of the book. Compared to the trails blazed by the chapters on natural history and science, the historical sections come across as slightly more laboured.

All in all, I think Fortey succeeds in seeing "the wood for the trees", and sharing this vision with his reader—to see and to paint a wider picture from his own small patch. However, unlike in Mabey's *Beechcombing*, a plea or plan for protecting woodlands in a wider context is not the focal point. Climate change is deplored, but generally and briefly. Controversial practices like the shooting of gamebirds is rightly mentioned as one reason why some pieces of ancient woodland may have survived, but apart from one brief remark about the resulting persecution of birds of prey, this is not really followed up in all its consequences for key species and biodiversity. Unlike *Beechcombing*, this is not a political book, and while it lacks the sense of impending loss that imbues so many other similar titles, this could also be something that readers might find refreshing.

Fortey seems to be content to own his piece of woodland, and to literally put it into a box—his own cabinet of curiosities, a cabinet specially made from his own cherry wood to hold a collection of some of the treasured spoils of the woodlands themselves. One gets the impression that his sense of quiet optimism may derive from a collector's sense of reassurance that a precious specimen is safe in his ownership, in his care, in a cabinet or drawer.

Elaine Charwat, *Deputy Librarian*
elainec@linnean.org

228th Anniversary Meeting of the Linnean Society

held at Burlington House, Piccadilly, London W1J 0BF

4.00 pm, Friday 24 May 2016

1. **The President** took the Chair and welcomed 91 Fellows and their 29 guests to the meeting.
2. **Apologies** had been received from 25 Fellows.
3. **Admission of Fellows**: The following signed the Obligation in the Roll and Charter Book and were admitted Fellows: Juliet BRODIE, Isabelle CHARMANTIER, Nick CRUMPTON, Colin ELLIS, Jonathan HEYWOOD, Gregory JOHNSON, Tom KENNETT, Nick LANE, John Patrick MCQUILLAN, Christopher MICHAELS, Silvia PRESSEL, Monica WILDE, Nicholas WRAY, and Margaret WRIGHT
4. The **Minutes of the Meeting held on 21 April 2016** were accepted and signed.
5. **Third Reading of Proposed Byelaw Amendments.** The Executive Secretary summarised the proposed Bye-law amendments, which were posted in the Society's Rooms and on its website, as follows:
   - Lowering the age for Fellowship from 21 years to 18 years, reflecting the age of majority.
   - Removing the age cap for Student Associates, currently 24 years, to accommodate mature students. Student Associates will continue to enjoy a reduced Contribution.
   - Effectively re-defining the 'Associate' category. Associates are currently defined as aged between 18 and 29 years old, and pay a reduced Contribution. The age cap will be removed, and Associates will pay the same contribution as Fellows. This will effectively create a category of 'Friends' *ie* those individuals who want to support the Society but who do not wish to go through the formal election process.
   - There will be no formal election process for Associates and Student Associates. They must complete the relevant application form, which will be made available to Council for information and then pay their dues. They may apply for election to the Fellowship at any time and must then go through the usual formal process of election and admission.
   - It is intended to increase the annual contribution for Fellows from £50 to £55 from May 2017, but the Student Associate rate will remain at £10.
   - A printed List of members will not be produced but a searchable database will be available in the private Fellow's area of the website (in due course).
6. **Third Reading of Certificates of Recommendation for FMLS and HonFLS:**
   a. **Foreign Member:** ***Dr Frederick (Eric) Hochberg***

      Frederick (Eric) G. Hochberg, is the former Curator of Invertebrates at the Santa Barbara Museum of Natural History in California, and is presently

Curator Emeritus. He has an international reputation in two main fields, namely, Cephalopod biology and Taxonomy, and Nature Printing. Dr Hochberg was a founder member (1983) and President (1995–97) of CIAC (Cephalopod International Advisory Council) for research and cooperation on cephalopod animals and fisheries. He was also co-founder (1976) of the Nature Printing Society—an international organisation to awaken interest in printing directly from nature—Eric's tireless role as practitioner, teacher, promoter of this ancient Japanese art form, over more than forty years, meshes with the Linnean Society's own emphasis on faithful illustration. Frederick Hochberg richly merits the honour of becoming a Foreign Member of the Linnean Society.

b. ***Fellows honoris causa:*** ***Dr Lewis Derrick***

Dr Lewis Derrick has been a Fellow of the Linnean Society since 1977. His BSc and PhD at the University of St Andrews in Scotland were followed by taxonomic work, at the University of Reading, culminating in the production of an 8000-entry fern checklist. In the late '80s he moved to publishing, where he remains today, having worked variously with Academic Press, Harcourt, Blackwell and Wiley. He has indexed the *Botanical Journal of the Linnean Society* from 1982, as well as special volumes of the *Biological Journal of the Linnean Society* from 1995–2001. Lewis Derrick has given freely of his time to the Society for over 30 years—one of the unseen, unsung heroes—and thus his election to Fellow *honoris causa* is truly commendable.

c. ***Fellows honoris causa:*** ***Professor Grenville Lucas OBE***

Professor Grenville Lucas OBE has been a Fellow of the Linnean Society since 1960, and has held the office of Treasurer since his retirement from the Royal Botanic Gardens Kew in 1995 until today. Gren became Keeper of the Herbarium and Library at Kew. As a Trustee of WWF (UK) and former Chairman of the Species Survival Commission of the IUCN, Gren also worked tirelessly to elevate the awareness of plant conservation. Gren's activities were recognised in 1980 with the OBE for services to Conservation. This was followed in 1986 with the award of Officer of the Golden Ark from the Prince of the Netherlands. Gren has also been Vice President of the Royal Geographical Society and a Council member of English Nature. Gren was awarded the Linnean Gold Medal in 2007—this is the Linnean Society's highest honour in recognition of outstanding service to the Society, and thus we propose that he be elected Fellow *honoris causa* today.

7. **Appointment of Scrutineers.** The following were appointed as scrutineers; Rosie Atkins, Dr Paul Bates and Professor Juliet Brodie.

8. **Ballots.** Fellows voted in the ballots for Members of Council (5 of 5 nominees), the Officers (6) and for Fellows (28) and Associates (1), as well as for the Byelaw amendments.

9. Citations and Presentations of Medals and Awards. Powerpoint presentations showing the respective medal winners and their field of interest were shown during the reading of the citations.

a. The **2016 Linnean Medal in the field of Botany** was awarded to **Dr Sandra Knapp**. Dr Knapp was unable to be present at the Anniversary Meeting and the Medal was presented by the President at the Extraordinary Meeting of the Linnean Society held 7 May at the Arnold Arboretum of Harvard University in Boston. A video clip of the presentation in Boston was shown, which included Dr Knapp's acceptance speech. The citation was read by ***Treasurer Professor Gren Lucas OBE:***

"Dr Sandy Knapp is currently Head of the Plants Division at the Natural History Museum, and obtained her PhD from Cornell University. She is the foremost authority on taxonomy and phylogeny of the family Solanaceae, including the mega-diverse genus *Solanum.* Extensive fieldwork in the Neotropics has led to published descriptions of 100 new species. Her current research encompasses phylogenetics, genome evolution, domestication and conservation.

Sandy leads the Flora Mesoamericana project, serves as a Council Member of the International Association for Plant Taxonomy. As the President of the Nomenclature Section of the International Botanical Congress, she was instrumental in gaining consensus on the proposal for electronic publication of plant names. Sandy has been a long-term member of the International Panel on Biodiversity and Ecosystem Services (IPBES), and sits on the BSS (Biosciences for Society Strategy Committee). She is also a Trustee of the International Commission on Zoological Nomenclature.

Sandy has had a prolific research output, with over 200 research papers as well as 21 books, including popular works such as *Potted Histories* and *Letters to Linnaeus*. Sandy has served as a Council Member, Botanical/Scientific Secretary and Vice President of the Linnean Society and on editorial boards and advisory panels for several journals. No account of Sandy's achievements could fail to include a description of her public outreach, for which she has received prestigious awards, both in the US and UK.

In view of her outstanding contributions to plant taxonomy, natural history and conservation, and for her ability to communicate science enthusiastically to wide audiences over many years, Dr Sandy Knapp is undoubtedly a very worthy candidate for the Linnean Medal 2016."

b. The President presented the **2016 Linnean Medal in the field of Zoology** to **Professor Dame Georgina Mace**. The citation was read by ***the President:***

"Professor Georgina Mace is Professor of Biodiversity and Ecosystems, and Head of the Centre for Biodiversity and Environment Research at University College London. Prior to joining UCL, she was Director of the NERC Centre for Population Biology at Imperial College London, and before that she worked at the Institute of Zoology, Zoological Society of London. Graduating in zoology at the University of Liverpool, she gained her PhD (ecology) from the University of Sussex. Georgina is now a world leader in conservation biology. She is well known for three fundamental contributions.

First, working together with Prof Russell Lande, she designed criteria used to assess the risk of extinction of species, adopted by IUCN (The World Conservation Union) for their Red Lists of Threatened Species, and incorporated in the species listed under the international Convention on Trade in Endangered Species (CITES). The theoretical and practical significance of this contribution can hardly be overstated.

Second, penetrating comparative analyses of extinction risk in various groups of species, developed theoretical and empirical approaches towards understanding the impacts of climate change on species, providing an influential perspective on the relationships between taxonomy and conservation.

And third, Georgina has made important contributions in assessments of the state of the global biodiversity, and in serving in numerous national and international committees, as well as editorial boards.

Georgina was elected FRS in 2002, and was the 2007 winner of the International Cosmos prize. She was awarded an OBE in 1998, a CBE in 2007, and Dame Commander of the Order of the British Empire (DBE) in the 2016 New Year Honours for services to science. Thus Georgina Mace has made an absolutely outstanding contribution to understanding and conserving global biodiversity, and is a truly worthy recipient of the 2016 Linnean Medal."

c. The President presented the **2016 Darwin-Wallace Medal** to both **Professors Pamela Soltis and Douglas Soltis**. The citation was read by ***Editorial Secretary Professor Mark Chase***:

"Pamela and Douglas Soltis are Distinguished Professors at the University of Florida and principal investigators of the Laboratory of Molecular Systematics and Evolutionary Genetics at the Florida Museum of Natural History. They are world leaders in the study of evolution and diversification of angiosperms (flowering plants), including phylogeny reconstruction, genome evolution, polyploidy, floral developmental genetics, phylogeography and population

biology, and use modern DNA approaches and 'big data' sets that require challenging computational analyses.

Their collaborative studies—from a ground-breaking paper in 1993 to another in 1999—brought the field of angiosperm phylogenetics to a general scientific audience through the readership of *Nature*, and have formed the foundation for much of our current understanding of angiosperm phylogeny, resulting in updated classifications (APG II and III, the Angiosperm Phylogeny Group, of which Doug and Pam are a key members). The APG papers have changed the way systematics is approached.

Pam and Doug also ushered in the modern, molecular genetic investigation of polyploidy, completely revising the traditional paradigms of polyploidy, replacing polyploid evolution with a modern 'revised synthesis'. Using *Tragopogon* as an evolutionary model (a system Doug has developed and been working on for ~30 years), Doug has shown that major changes occur early following polyploidization, that helps generate evolutionary novelty.

The Soltises have also pioneered phylogeographic studies in plants; an early paper, focused on the Pacific northwest of North America, resulted in a geographical genetic break (now observed in both plants and animals) that has come to be referred to as the 'Soltis line'.

Doug's H-index according to Web of Science is 95; Pam's h-index is 91. The Soltises have been officers in several societies, including President of the Botanical Society of America.

Pamela and Douglas Soltis are thus a formidable team and have made a huge contribution to the field of evolutionary biology, thus making them each extremely worthy recipients of the 2016 Darwin Wallace Medal."

d. The President presented the **2016 Bicentenary Medal** to **Dr Anjali Goswami**. The citation was read by ***the President:***

"Dr Anjali Goswami is an outstanding research scientist currently jointly appointed as Reader in Palaeobiology in the Department of Genetics, Evolution & Environment and the Department of Earth Sciences at UCL. Dr Goswami's research is remarkable in both productivity and innovation. Her work is recognised as unique in bridging palaeobiology, zoology, development, genetics, biodiversity, and evolutionary biology. Anjali has focused on vertebrate evolution and development, developing cutting-edge 3-D image analysis and quantitative methods to test hypotheses on factors shaping morphological evolution at a macroevolutionary scale with simulations and empirical data. Although based in a deep-time perspective and incorporating palaeontological data as a priority, Anjali's work is grounded in extant data and "evo-devo".

Medal and Award Winners from Left to Right: Professor Dame Georgina Mace (Front), Dr Thomas Halliday (Back), Dr Anjali Goswami (Front), Professor Paul Brakefield FRS PLS (Back), Edgar Turner, Anita Barley, Christopher Williamson, Imogen Sparkes and Professors Pamela and Douglas Soltis

Her work in the field has demonstrated that late Cretaceous Indian mammals are not early placentals, but instead a separate radiation of arboreal mammals, and that troodontid dinosaurs, a close relative of birds were present in India (their first confirmed Gondwanan occurrence).

The importance and recognition of her work is reflected in her great success at obtaining significant external funding from the European Research Council and Leverhulme Trust. She is also currently collaborating as the data collection and analysis expert on a US National Science Foundation grant studying the morphological evolution of whales. In addition to her research commitments, Dr Goswami is an active participant in public outreach, and as a scientific expert for radio, TV, and print journalism. For all of these outstanding contributions in her field, Anjali Goswami is a most deserving recipient of the 2016 Bicentenary Medal."

e. The President presented **the 2016 Trail-Crisp Medal** to **Dr Imogen Sparkes**. The citation was read by ***Scientific Secretary Professor Simon Hiscock***:

"Imogen Sparkes is a Senior lecturer in Cell Biology at Exeter University, and is a recognised plant cell biologist with interests in understanding the role and regulation of organelle movement and morphology. Imogen graduated from Cambridge University and obtained her PhD at Leeds University, publishing one of the first papers documenting a critical role for peroxisomes in plant development. She has been active in the cell biology behind peroxisome biogenesis and elucidating organelle movement and interactions.

Imogen's expertise in plant myosins was recognised through the award of a highly competitive research grant from the BBSRC. In addition, her expertise in components that drive ER formation and dynamics is recognised through co-investigator status on a separate competitive BBSRC grant.

Imogen has pioneered high end imaging techniques, including optical tweezers, and analytical methods with mathematical modellers, developing the optical tweezer system to allow quantification of peroxisome-chloroplast interactions allowing the forces involved in the process to be modelled. Since joining the University of Exeter in 2012, she has established a significant research group and forged national and international collaborations with numerous other established principal investigators, mathematicians and computer scientists to study biophysical and mathematical constraints on ER geometry. Her expertise has already resulted in 41 peer reviewed publications. All-in-all, an impressive record in utilising microscopy, making Imogen Sparkes a most worthy recipient of the Trail Crisp award in 2016."

f. The President presented the **2016 Irene Manton Prize** to **Dr Christopher Williamson**. The citation was read by ***Scientific Secretary Professor Simon Hiscock:***

"Dr Williamson's thesis, entitled '*Impacts of ocean acidification in calcifying macroalgae'*, is a holistic ecophysiological study across the Northeast Atlantic of two genera of red coralline algae, *Corallina* and *Ellisolandia*. These algae are the most abundant and important calcifying macroalgae worldwide. They are major contributors to CO_2 fluxes, key reef building primary producers, provide niches for other organisms, induce recruitment and metamorphosis of many commercially important species and provide settlement cues to the microphytobenthos.

Dr Williamson examined these calcified species in intertidal rockpools to facilitate predictions of ocean-acidification and warming impacts on these ecosystem engineers. Three studies were undertaken: (i) the production, respiration, calcification and growth of *Corallina* in relation to irradiance, water temperature, and carbonate chemistry; (ii) the photoacclimation and photoregulation strategies of *Corallina* and *Ellisolandia*; and (iii) the recent-past (1850–2010) and present-day skeletal mineralogy (Mg/Ca ratios) of


Dr Christopher Williamson

Corallina and *Ellisolandia* and its relationship to sea surface temperature. The overall conclusion was that the coralline algae studied have the potential to survive under future ocean acidification conditions.

This thesis is significant because it is an outstanding piece of empirical research underpinned by hard physiological data and state of the art taxonomy that transforms our understanding of how these calcified seaweeds will respond to ocean acidification and climate change. Moreover, Chris has contributed significantly to the scientific community during his time as a PhD student. He has already successfully initiated and supervised two undergraduate students and one master's student. This is an impressive record for someone at this stage in their career.

For his outstanding thesis, Dr Christopher Williamson is a truly deserving winner of the Irene Manton Prize 2016."

g. The President presented the **2016 John C Marsden Medal to Dr Thomas Halliday.** The citation was read by ***Scientific Secretary Dr Malcolm Scoble:***

"The Cretaceous-Palaeogene extinction 66 million years ago saw the end of non-avian dinosaurs and the beginning of the 'Age of Mammals'. Many recent studies have attempted to quantify the effect of the K/Pg event on mammal evolution, but all suffer from a lack of data for Palaeocene mammals, from which most modern orders presumably evolved.

Dr Halliday's thesis is entitled **'***The enigmatic evolutionary relationships of Palaeocene mammals and their relevance for the Tertiary radiation of placental mammals'* has addressed the lack of data for Palaeocene mammals, from which most modern orders presumably evolved. His thesis sets out three key aims: firstly to establish relationships amongst the earliest crown placental mammals, secondly to date the origin of placentals and the divergence dates of the major placental groups, thirdly to determine the rates of placental diversity across the K-Pg boundary. A major cladistic analysis of placental mammals involved nearly 700 morphological characters from more than 170 fossil and living taxa, Dr Halliday demonstrated great facility with the various statistical techniques he used to interrogate the data. This work demonstrated that disparity increased immediately after the K/Pg boundary. Dr Halliday has already published two significant papers based on this research, one in the *Biological Journal of the Linnean Society* and the other in *Biological Reviews*, and further papers are in progress.

In summary, Dr Halliday's thesis is an exceptional and important study of phylogenetics and macroevolution of early placental mammals, incorporating taxonomy, systematics, evolutionary-development, fieldwork, and the application and development of new macroevolutionary analyses, and thus he truly merits the John C Marsden Medal 2016."

h. The President presented the **2016 Jill Smythies Award** to **Anita Barley**. The citation was read by ***Treasurer Professor Gren Lucas***:


Anita Barley

"Anita Barley produces extraordinarily detailed and beautiful botanical drawings, examples of which were recently exhibited at Kew Gardens. To date, Anita has produced well over 1,000 botanical drawings in colour and black & white for various scientific publications. Many were undertaken during the 15 years that she was the Botanical Illustrator based in the National Herbarium of Victoria. Since the mid-90's, she has continued to work as a freelance contractor both in Australia and now in the UK. Particularly beautiful illustrations include those for *Flora of Victoria* (for which she was the main illustrator) and also the *Flora of Australia*.

Her attention to detail—both in the shape and form of the plants and also the meticulous shading, producing a 3-D effect that is rarely seen in botanical line drawings, bringing alive the plants in her drawings and placing work on the page so that the eye is naturally drawn to the plant and the key taxonomic traits.

Anita has twice been awarded the Celia Rosser Medal for botanical art, in 2002 and 2006, and her important contribution to botanical art was recognised in the publication *Australia: 300 years of Botanical Illustration*. Anita is someone with a real gift for botanical drawing and thus she is a truly worthy recipient for the 2016 Jill Smythies Award."

i. The President presented the **2016 HH Bloomer Award** to **Howard Matcham**. The citation was read by ***Collections Secretary Dr John David***:

"Howard Matcham left school at 15 with no formal qualifications, travelling the world in the Royal Navy for 10 years and his interest in plants only began in the 1970s. As a taxi driver, mainly working night shifts, he spend his free time botanizing. He joined the British Bryological Society in 1985 and since then has variously served that Society as Council member, Recorder and Managing Editor of its flagship journal.

Howard soon became a highly proficient field bryologist with a gift for manipulating delicate plant materials. Aside from the new local records,

Howard has been responsible for the discovery of 2 mosses new to Britain and has considerably extended our understanding of asexual propagules in mosses. As a result of his British reputation in bryophyte taxonomy, Howard has been asked to carry out many environmental impact studies for a variety of agencies.

His bryological horizons became global in the 1990s as his taxonomic skills had become increasingly recognised internationally. He was invited to join British Council and Darwin funded projects to Lesotho and South Africa, Chile, Uganda and Reunion. On all these expeditions he found mosses new to the different continents and most recently is a co-author of a book *The Field Guide and Bryophyte Flora of Ascension Island*. He now boasts more than 30 publications on bryophytes. Nor is Howard just content with bryophytes. His exhaustive observations on microfungi and algae have resulted in species of both groups new to Britain and Europe. Several of his collections are used as illustrations in the *Freshwater Algae of North America: ecology and classification*.

Thus, Howard is second to none in his dedication to natural history, and with such a broad knowledge of such a wide range of organisms, he is a most worthy recipient of the HH Bloomer Award 2016."

j. The President presented the **2016 John Spedan Lewis Medal** to **Edgar Turner**. The citation was read by ***Collections Secretary Dr John David*:**

"Dr Edgar Turner has held the position of Academic Director and Teaching Officer in Biological Sciences, Institute of Continuing Education at the University of Cambridge since 2012, having previously been the *Ecology Groups Officer* for the Bedfordshire, Cambridgeshire and Northamptonshire Wildlife Trust. He has experience of curation, remedial conservation and cataloguing of insect collections, and has dealt with public enquiries and research visitors. His research focuses on the impacts of habitat change on biodiversity and ecosystem functioning, both in Southeast Asia and the UK.

He has extensive experience of coordinating and running outreach events and talks, in association with the Cambridge Science Week, the Festival of Ideas, and Cambridge Bioblitz. He is Chairman of the Cambridge Local Group of the Wildlife Trust and an approved speaker for the Cambridge Federation of the Women's Institute. He has presented at conferences, research facilities, field centres, schools and public meetings (over 150 presentations since 2006).

In the UK, he collaborates with the Bedfordshire, Cambridgeshire and Northamptonshire (BCN) Wildlife Trust, and has led research projects to investigate management techniques to conserve biodiversity and the long-term maintenance of threatened species on their reserves. so management recommendations that stem from this collaboration are likely to have conservation impacts across the UK.

Currently, in Southeast Asia, he leads two research projects: the Stability of Altered Forest Ecosystems (SAFE) Project, based in Sabah, Malaysia, and the Biodiversity and Ecosystem Function in Tropical Agriculture (BEFTA) Project, based in Riau, Indonesia. Both projects investigate ways that tropical agricultural landscapes can be managed to maintain biodiversity, while still allowing agricultural productivity.

Dr Turner has already received a number of awards, including the 2015 Pilkington Teaching Prize, and was Specially Commended by Chilterns Conservation Board for the *Dukes versus Blues* Project."

10. Treasurer's Report

The Treasurer presented the **Accounts for 2015**, full details of which were in the 2015 Annual Report mailed to all Fellows in mid-April. The Treasurer summarised highlights of the Society's achievements during the year and made reference to the ongoing arbitration process that the Courtyard Societies are pursuing regarding the lease for New Burlington House and more particularly the rent mechanism. He reviewed the figures in the Annual Accounts, explaining the Society's revenue and expenditure, pointing out the welcome effect of legacies and donations bolstering income (although not wanting to be 'too rich' when it comes to seeking grant funding). The Treasurer noted some comparative statistics (1995 and 2015) which showed how the Society had grown around 3-fold during his term: Contributions had risen from £77k to £129k; Publications revenue from £106k to £674k; while investment income had dropped from £85k to £32k, reflecting the difficult economic times currently. Overall expenditure had risen from £303k to £932k, while the balance sheet had gone from £1.138m to £4.61m (of which £1.4m was for the gifted Darwin Wallace Collection). He concluded by expressing special thanks to the Society's staff, curators and other volunteers, as well as to the Journal Editors and Publishers, thanking them for their unerring commitment to the Society.

The Treasurer then went on to launch the biography of Sir James Edward Smith, *The Lord Treasurer of Botany*, which the Society had commissioned Tom Kennett to write. A brief promotional video about the book was then shown. The Society's Special Publications Manager, Leonie Berwick, who had been responsible for producing the book, was also to be applauded for her diligent efforts in ensuring a truly professional finish. The Society was especially privileged that the Professor Janet Browne, Aramont Professor of the History of Science at Harvard University, had written the preface. The book would be selling at a 20% discount [for a few weeks] and Tom Kennett was available for signing copies in the foyer, where there was also an exhibition of the exquisite original artwork (maps and houses) which had been produced for the book by the Society's former Project Conservator, Helen Cowdy. Prints of these illustrations were also available for purchase.

11. Motion to Accept Accounts for 2014

Dr Mary Morris, a member of the **Audit Review Committee** read the following statement. "In accordance with Bye-Law 12.6, the Annual Statement of Accounts for 2015, and the report of the professional auditors, were carefully examined by the Audit Review Committee of Fellows on 14 March 2016. On behalf of the Committee, of which I was a member, I am pleased to report to the Anniversary Meeting that we concluded that the Accounts give a true and fair view of the Society's finances as at 31 December 2015. I therefore move that they be accepted". This was carried unanimously on a show of hands.

12. Appointment of Auditors for 2015 and Banking Arrangements

a. **The Treasurer** moved that the firm of **Knox Cropper, of 16 New Bridge Street, EC4V 6AX**, be appointed as **auditors** in accordance with Bye-Law 12.5, which was accepted unanimously.

b. **The Treasurer** moved that **Barclays PLC, PO Box 13555 Acorn House, 36–38 Park Royal Road, London NW10 7WJ** be reappointed as the Society's **bankers** and this was accepted unanimously.

13. The Presidential Address: *Eyespots on Butterfly Wings and the Science of Natural History*

The President explained how the African mycalesine butterfly, *Bicyclus anynana*, is a model species that has been used to help understand the processes of adaptive evolution by natural selection through applying a broad 'science of natural history'. Topics of special interest to his research group had been seasonal polyphenism, eyespot pattern evolution and the concept of developmental bias but these are all relevant to broader questions. For example, is natural selection 'all-powerful' and does how development works influence the paths of evolution? The President's research group now seeks to use the knowledge from the single species work to understand both pattern and process underlying the diversification of some 300 related species of mycalesine butterflies. They are working with several key sets of traits in mycalesine butterflies to examine the parallel radiations that have occurred in Africa, Madagascar and Asia over the past 17MY. Has the evolution of developmental phenotypic plasticity been crucial for expansions from forests in to grassland habitats with both wet and dry seasons? Have the radiations also been associated with the evolution of C_4 grasses in open habitats? They have also begun to explore patterns of diversity in wing androconia and male sex pheromones that are involved in mate choice, the evolution of reproductive isolation, and speciation. The science of natural history is as relevant now to understanding biodiversity as it was in the days of Linnaeus, Darwin and Wallace.

14. On behalf of the Fellows, Dr Malcolm Scoble thanked the President for his fascinating talk.

15. Results of the Ballots (76 and 82 papers, respectively, returned for Officers and Council, 77 for Foreign Member and honoris causa, 79 for Fellows & Associates)

a. The following were elected to Council: Dr Maarten Christenhusz (freelance botanist, plant classification), Dr Christopher Michaels (herpetologist at ZSL), Dr Paul Smith (Secretary General Botanic Gardens Conservation International), Dr Rosie Trevelyan (Director Tropical Biology Association, based in Cambridge & Nairobi) and Dr Mark Watson (taxonomist, botanist, Royal Botanic Garden Edinburgh).

   Details of these new Council members can be found in *The Linnean Society of London Anniversary Meeting 2016 Council Agenda and Council Nominations*, circulated with *The Linnean* in April 2016. The President thanked the outgoing Council members, Professor Anthony Campbell, Professor Mark Seaward and Dr Michael Wilson, for their services to the Society.

b. **Professor Gren Ll Lucas OBE** was standing down as Treasurer. The Officers thus duly elected were: **President, Professor Paul Brakefield FRS**; **Treasurer, Deborah Wright**; **Collections Secretary, Dr John David**; **Editorial Secretary, Dr Mark Chase FRS**; **Scientific Secretary, Professor Simon Hiscock**; and **Scientific Secretary, Dr Malcolm Scoble**.

c. The Fellows were elected as on the 24 May 2016 ballot list (28 Fellows and 1 Associate).

d. The Byelaw amendments were all duly carried.

16. Names of Vice-Presidents

The President, Professor Paul Brakefield, named his Vice Presidents for the coming year as **Dr Malcolm Scoble, Professor Juliet Brodie, Professor Max Telford** and **Professor Simon Hiscock**.

17. Future Events

The President noted the dates of forthcoming meetings:

- 1 June Lunchtime lecture on Dinosaurs in the Crystal Palace with Joe Cain
- 7 June Nature Reader Event: launch of *The Lord Treasurer of Botany*, with Tom Kennett
- 16 June Evening lecture on 'When Antartica was green' with Jane Francis, Director of the British Antarctic Survey
- 8 July Conversazione at Burlington House, when we will be celebrating Gren Lucas' 20 years as Treasurer of the Society.

18. Any Other Valid Business

The President formally admitted Gregory JOHNSON, who had just been elected in the ballot.

Professor Gren Ll Lucas OBE

The President then presented the out-going Treasurer, Professor Gren Lucas, with a gift of a Victorian-style tile handmade by the Society's Archivist *emerita*, Gina Douglas, to add to his existing collection of Victorian tiles.

The Financial Controller, Priya Nithianandan, then paid his personal tribute to the Treasurer.

"Gren became Treasurer in 1995 which means that we have worked together now for over two decades. This is a long time but he has made it a very pleasant journey for me. The Society has made huge progress both financially and otherwise under Gren's stewardship. An achievement which is significant given the challenges that the Society has faced during this period. Gren's optimistic outlook, his ability to be both cautious, and bold to take radical decisions, have contributed tremendously to the Society's success. His commitment to the Society has been beyond the call of duty, he is like a full time staff member with his finger firmly on the Society's pulse. There are very few like him. It is important to understand that the future existence and success of organisations like the Linn Soc is very very dependent on individuals like him who are committed to the Society. On a personal note, Gren has been very supportive of me—always available at the end of a telephone line, if not in person. I think you can measure his prominence in my life by the fact that he is well known and liked by all in my family including my teenage daughters which is a fairly significant achievement in its own right! And I think I can safely say that he has extended the same support to other staff members at the Society making it a wonderful place of work. So, a heartfelt thank you to you Gren—and also a warning that you have not got rid of me as yet."

There being no other valid business, the President declared the meeting closed.

THE NEXT **ANNIVERSARY MEETING** WILL BE ON **WEDNESDAY 24 MAY 2017** AT **4PM**.

The Linnean Society of London : Programme of Events

November 2016–February 2017

2 Nov
12.30–13.00
Wildlife Live: A Springwatch Experience
James Smith, *BBC*

3 Nov ★
18.00
Global De-worming: A Darwinian Perspective
DARWIN LECTURE 2016: In association with the Royal Society of Medicine
Taking place at the Linnean Society of London **(FULLY BOOKED)**

17 Nov A
18.00
Form, Function and Fisheries: The Scientific Legacy of Edward Stuart Russell
Prof Roger Downie, *University of Glasgow* and Carl O'Brien, *Defra Chief Fisheries Science Adviser*

2 Dec A
18.00
The Invention of Nature
FOUNDER'S DAY LECTURE 2016
Andrea Wulf, *Winner of the Royal Society Insight Investment Science Book Prize 2016*

6 Dec ★
16.00
On You, Inside You: The Amazing World of Parasites
IRENE MANTON LECTURE 2016: Taking place at Manchester Museum
Dr Sheena Cruickshank, *University of Manchester*
To register: https://www.linnean.org/Irene-Manton-Manchester

7 Dec
12.30–13.00
The Botany of Christmas
Dr Mark Nesbitt, *Royal Botanic Gardens, Kew*

18 Jan 2017
12.30–13.00
Josef Frank: Patterns – Furniture – Painting
Celia Joicey, *Fashion and Textile Museum London*

19 Jan A
18.00
From Genome Evolution to Animal Diversity: A Tale of Moths and Mammals
Prof Peter Holland, *University of Oxford*

1 Feb
12.30–13.00
Anglo-Nepalese Zoological Illustrations: Colonial Naturalists and London Scientific Institutions in the Early-19th Century
Dr David Lowther, *Durham University*

9 Feb
18.00
So Many Celestial Animals So Vividly Drawn: Birds and their Images in Pre-Linnean Italy
NATURE READER: Henrietta McBurney Ryan FLS and Carlo Violani FLS

☂ Organiser(s) • ★ Registration required • * Payment required • A Admission of Fellows

All meetings are held in the Society's Rooms unless otherwise stated.
A tea reception precedes evening meetings at 17.30.
Evening meetings begin at 18.00 and are followed by a wine reception in the Library.

For more details and other events visit **www.linnean.org/events**