The LINNEAN SOCIETY of London

The Linnean

NEWSLETTER AND PROCEEDINGS OF THE LINNEAN SOCIETY OF LONDON

Volume 34 Number 1 April 2018

Lichens:
A Linnaean misconception rectified

Royal Charters:
The documents that enshrine the Society's traditions

Garden of Ideas:
The Jardin des Plantes in Paris

AND MORE...

A forum for natural history

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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.

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The Linnean

Newsletter and Proceedings of the Linnean Society of London

Contents

Editorial

Fellows will be happy to learn that all Special Issues (SI) published to date are now available online, including SI 3: *Wheat Taxonomy: The Legacy of John Percival.* All back issues are also available to peruse at www.linnean.org/thelinnean.

The request for book reviewers has now brought in a number of reviews, with this issue prioritising reviews for publications already available in the Society's library for loan. Lists of incoming books for review are now circulated periodically to the panel of reviewers; please contact me if you wish to be added to that panel. Some review copies are returned and made available for visitors to buy on our book sale shelf, so it is well worth checking to see what is there whenever visiting the Society. All money received goes towards book conservation or library purchases.

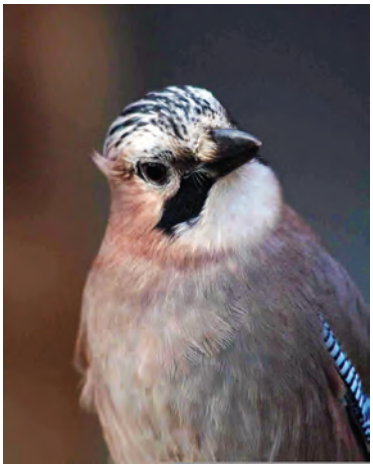
Lastly, you will notice one of the papers is longer than usual; by Council member Dr Mark F Watson FLS, it delves into the fascinating history of our Royal Charter and subsequent updates, including the inclusion of women as Fellows—apposite during the 100 year anniverary of women achieving the vote in the UK.

Gina Douglas, *Editor*
gina@linnean.org

This year is the 230th anniversary of the Linnean Society's foundation: in March, we used the Society's first 15 female Fellows (admitted in January 1905) as a springboard to celebrate women in science, with keynote speaker Prof Athene Donald DBE FRS, concluding with cocktails inspired by these outstanding first female Fellows. A Virtual Issue, featuring research by five of these female pioneers, was made freely available online for all three of our journals in March. Celebrations continued the following evening at the Awards Ceremony for the creative science project 'BioMedia Meltdown' (BMM), generously funded by John Lyon's Charity, and skilfully managed by Elisa Jones. Students took part in interactive creative science activities and were able to meet creative career scientists. We are indebted to our hardworking competition judges: Dennis Taylor, Dr Peter Leckstein FLS, Eleanor Armstrong, Myrofora Drakopoulou, Leonie Berwick, Joe Burton and Dr Leanne Melbourne.

Prof Athene Donald DBE FRS was our fantastic keynote speaker for the Society's *Women in Science* event

You will have seen those last two names in the December issue of *PuLSe*—we warmly welcome the incoming Events & Communications Manager Dr Leanne Melbourne and the Education & Public Engagement Manager Joe Burton. Sadly, we said fond farewells to Alicia Fernández and Dr Rhys Grant, and we thank them sincerely for their huge contributions to the Society.



Prof Nicky Clayton FRS compared cognitive abilities in corvids and children for her fascinating lecture

Expanding Audiences

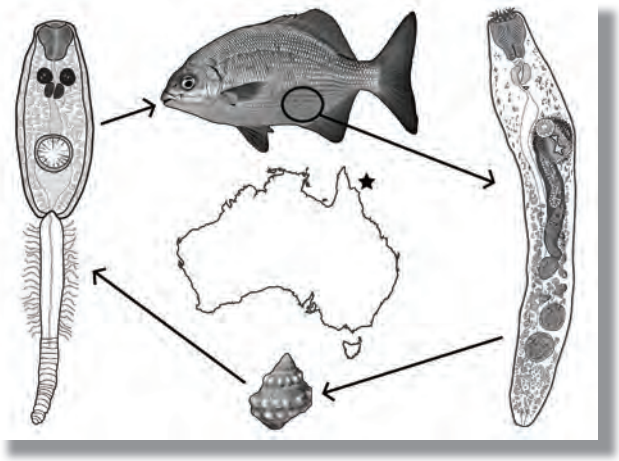
The Society continues to invest in developing further online resources based around its world-famous collections, using the knowledge-base and passion of its Fellowship, staff and volunteers. We are delighted with the fantastic response to the Linnean Learning video series released towards the end of 2017, stunningly animated by Ross Ziegelmeier with support from staff and Fellows. As we go to press, total views numbered well over 6,000.

Audiences for the Society's public lecture series continue to grow, and the online registration system has now been greatly simplified to one simple step. Highlights over the past six months include Prof Tim Birkhead on the diversity of bird eggs, and the Hallowe'en-themed talk by Dr Elizabeth Clare FLS on

bat ecology. Also successful were the annual Sir Julian Huxley Lecture on *Fungi in the Oceans Deep* with Prof Tom Richards (organised with the Systematics Association), the Annual Debate on Big Data [with the London Evolutionary Research Network (LERN)] and *Ways of Thinking: From Crows to Children and Back Again* where Prof Nicky Clayton FRS looked at cognitive abilities in corvids and children. Regional meetings in early 2018 included a lecture in Cardiff, organised by the local branch of the Royal Society of Biology. Please see our events brochure for details of future delights on how Linnaeus' sexual system influenced objects in the V&A exhibition *Fashioned from Nature*, and be there for the unveiling of Linnaeus' conserved herbarium cabinet at the Conversazione in July.

Supporting Early Career Researchers

The Attenborough Award for the best field work project has been awarded to PhD student Daniel Huston, for his efforts to elucidate cryptic speciation among Great Barrier Reef gorgocephalid trematodes. Also meritorious were Cristina Roquet's study on evolution of *Saxifraga*, and Gabriel Ferreira's evaluation of the dermal scales of extant and extinct turtles. Other research grants recently awarded by the Society include the Anne Sleep Award to Dr Shahina Ghazanfar FLS to update the *Flora of Oman*, and an Appleyard Fund award to Bethan Stagg FLS for an innovative educational research project to teach primary school children about Linnaeus through drama.



Daniel Huston has been awarded the Attenborough Award for his work on cryptic speciation among gorgocephalid trematodes in the Great Barrier Reef; shown here is the life cycle

Planning for the Future

Discussions at the Strategic Planning Day revealed a plethora of possibilities for the future of the Society, although the continuing uncertainty over long-term tenure in Burlington House remains an issue for this wonderful Cultural Campus. Our exciting, educational 'Discovery Room' is moving forward and we would be pleased to hear from you with workshop suggestions. Dr Sandy Knapp takes the Presidential reins in May 2018, and she has already identified a number of things she would like to implement, including a governance review, which is timely with the Society's plans to increase its charitable activities and impact.

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

Library News

Cataloguing of the Darwin-Wallace Collection is now complete, with more than 350 items ready for shelving in the bespoke glass-fronted bookcases due to be installed in the Society's 'Discovery Room'. This challenging cataloguing project has been carried out by a volunteer with excellent cataloguing skills. Another dedicated volunteer has been working on the Insch Tea Library. These books and journals are a unique resource and were bequeathed to the Society by James Insch, a tea planter in India. The records for the 450 or so items have now been upgraded and the collection has gradually been moved up into its new home in the Tower Room where a cabinet has been specially constructed to house it. Conservation of several of the Insch Tea Library books has been made possible by generous donations under the AdoptLINN scheme.

The Insch Tea Library has been moved, with several items adopted under our AdoptLINN conservation scheme

An ambitious programme of stock moves was undertaken in the autumn and early in 2018; in total nearly half a kilometre of stock was relocated. All staff pitched in and extra help was provided by several enthusiastic Library and Archive course students. The huge upheaval resulted in winning shelf-space at the midpoint of the Reading Room sequence; we were then able to utilise the space this January to ease the overcrowding on both sides of the room.

Botanical Curator Mark Spencer and Archivist Liz McGow

Library and Curatorial Staff Updates

Our Archivist, Liz McGow, is now on maternity leave and Vida Milovanovic has been recruited for one year to cover her absence. Vida will join the team after Easter. Since October, Elaine Charwat has been working with us in the role of Archive and Library Assistant. She has been dividing her time between cataloguing bound correspondence onto CALM and setting up the serials cataloguing

module. She has now catalogued a large number of serial titles which are starting to appear in the online library catalogue for the first time.

We have also been very fortunate in having Suzanne Ryder and Oliver Crimmen join the team of Honorary Curators. Mark Spencer has already been diligently looking after and advising on the Linnaean herbarium, while Suzanne will be taking care of the Linnaean insect collection and Oliver the Linnaean fish and shell collections.

Unusual Donations

Glenn Benson, our Curator of Artefacts, has recently received some unusual donations. A set of three crocodile skins (two adults and one juvenile) were presented to the Society by a visitor who had heard that the seat of the President's chair needed re-upholstering. We are currently following up with contacts to look into the possibility of commissioning this work.

The family of Professor W T Stearn PPLS kindly donated a tea set from his collection. It is decorated with images from the works of Maria Sibylla Merian (1647–1717) on the plants and insects of Suriname. We hope to exhibit this gift alongside the Society's copies of Merian's wonderful illustrations in the new Reading Room display cabinets later in the year.

The donated 'Merian' tea set from Prof W T Stearn PPLS

Linnaean Views and Visitors

In the autumn, Lynda Brooks gave a presentation on both Linnaeus and the Society to the Essex Branch of the English-Speaking Union, and members of the group visited the Society for a tour the following week. In November, Isabelle Charmantier spoke on Linnaeus' view of nature to the annual meeting of New Networks for Nature, and Elaine Charwat gave a presentation on Linnaeus and islands at a festival on Orkney.

Visits have been arranged for groups of students from Columbus State University, Dickinson College (Pennsylvania), University of Buckingham, Anglia Ruskin University, the South London Botanical Institute and the Workers Educational Association. Other visitors have included a group of antiquarian booksellers, NHM staff and volunteers from the Chelsea Physic Garden.

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:

Glenn Benson

Professor Janet Browne

Sarah Bunney

Jean Shaftoe Burton

The Estate of Professor W G Chaloner

Dr Isabelle Charmantier

Rosalyn Cleevely (from the collection of her late husband, Ron Cleevely)

Lord Cranbrook

Dr Bettina Dietz

Gina Douglas

Dr Aljos Farjon

Professor Boris Giannaccini

Jenny Grundy

Warren Hatch

Nigel Hughes

Katharina Lee Chichester

Professor Gren Lucas

Curtis McGlinchey

Tyrone McGlinchey

Christopher Mills

Dr Francisco Vázquez Pardo

David Pearman

Anita Sanchez

Dr Mark Watson

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**.

Subspecies in the Cypraeidae: Witness for the Defence

It was with great interest that I read Mr Okon's (2017) recent article on the naming of sub-species in the Cypraeidae. It is a group with which I am regrettably unfamiliar and, typically, I would therefore hesitate in venturing any refutation of what he has said. However, it seems to me that, although firmly grounded in this specific group of molluscs, his remarks are in fact illustrative of broader and more far reaching taxonomic problems, related to the description and categorisation of within-species phenotypic variation. Indeed, many of the points he made are applicable, at least in principle, to my own group, the Lepidoptera, and there are one or two that I feel I must offer an alternative perspective on.

My principle objection lies with his argument that "[w]hereas species is both a natural and taxonomic concept, subspecies is not, and has little biological meaning". I think that this could not be further from the truth. Species are indeed "natural" in that our classifying them as discrete entities reflects true isolation in a state of nature—under Mayr's definition of a population of freely interbreeding organisms, reproductively isolated from other such populations, a species might be thought of simply as an isolated pool of genes, cut-off from mixing with other such pools; the unique genetic composition of the pools, resultant from this isolation, gives each species their distinctive phenotypic characteristics. These, in turn, form the basis of any morphological means of species determination.

I would argue that, in a similar manner, the term "sub-species" is an attempt to taxonomically acknowledge geographical variation, resulting from local adaptation and random genetic drift, and provide a context in which it can be described and classified. We can imagine populations or groups of populations as being present at different points on an axis of speciation, from total genetic interchange and homogeneity (a single species) to complete genetic isolation and divergent gene pools (new daughter species). In this sense, then, the category "sub-species" is surely as biologically valid as "species" in that it too reflects a natural distinction; an isolated, phenotypically distinct population, albeit to a lesser degree and more modestly advanced along the road to speciation than full species.

I can, however, sympathise with the criticism that many populations or within-species variants are entirely inappropriately described as "sub-species". In the Lepidoptera, for instance, the geographically distinct populations of *Coenonympha tullia* which occur in Britain, named *scotica*, *polydama*, and *davus*, have been called sub-species, despite it being not at all uncommon for individuals resembling one "sub-species" to occur in the distribution of another. Indeed, localities are known where individuals belonging to all three "sub-species" fly together (Ford 1953). It seems to me that local adaptation is certainly at work—there is a discernible general pattern of geographical phenotypic variation (Dennis 1992)—but to name these groups sub-species, and at least implicitly suggest that they are in some way incipient full species, is I think very difficult to justify. This is a far softer form of divergence, with much continued gene flow, closer to the single species end of the axis I outlined above.

This approaches the heart of the issue as I see it—not a problem with sub-species as a concept, but rather a lack of any other recognised taxonomic categories for describing

different types of within-species variants. I have proposed the resurrection of the term "race", once used commonly by entomologists, for weakly divergent populations of the kind illustrated by *C. tullia* (Weir 2016). Similarly, Mr Okon eloquently illustrates the absurdity of calling what is plainly a polymorphic variety of *Zoila marginata*, of limited geographical distribution, a sub-species.

I am not, however, of the opinion that it is a waste of time to formally name within-species taxa. Rather, for those interested in intraspecific variation, such names are often as necessary as those of species, and for entirely the same reasons: to prevent repeated, lengthy and potentially confusing written descriptions. I believe that with a broader range of categories, that could be specified with prefixes to the formal names, so much more biological information could be conveyed: distinction could be made at a glance between weakly or strongly divergent geographical populations; polymorphic varieties; seasonal forms; rare mutants; and, so on. I have argued this case at some length previously (Weir 2016).

To conclude, sub-species is not only a meaningful category, it is essential if we wish to taxonomically describe biological reality. In fact, I regard the pre-eminent problem with naming intraspecific variants as being a lack of formal, taxonomic recognition for the different types of within-species variation evident in nature. Finally, I would emphasise that I do not make this recommendation for more complex naming lightly—lepidopterists have, more than most, been seduced by the allure of inventing new names and I suggest that the 446 named aberrations of the British lycaenid *Lysandra coridon* (Howarth 1973), make 1,500 names among 250 cypraeid species somewhat lose its sting.

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Jamie.Weir@ed-alumni.net

REFERENCES

Dennis RLH. 1992. *The Ecology of Butterflies in Britain.* Oxford University Press.
Ford EB. 1953. *Butterflies.* Collins.
Howarth TG. 1973. *Colour Identification Guide to Butterflies of the British Isles.* Viking.
Okon ME. 2017. Subspecies in the Cypraeidae: the case for the prosecution. *The Linnean* 33: 9–14.
Weir JC. 2016. Intraspecific taxonomy in the Lepidoptera. *British Journal of Entomology and Natural History* 29: 144–154.

UPCOMING EVENT

Maxwell Knight Symposium—Sat 24 November 2018

The British Herpetological Society (BHS) Commemorative Symposium

Organised by the British Herpetological Society (BHS), with support from the British Chelonia Group (BCG), the Amateur Entomologists Society (AES), the Institute of Animal Technology (IAT), the British Veterinary Zoological Society (BVZS), the Frightened Face of Nature (FFON) and others. The Symposium commemorates the 50th anniversary of the death of Maxwell Knight (MK), the famous naturalist, who was also MI5's 'Greatest Spymaster'. VENUE: Birkbeck College, London (tbc). **More in the next issue of *PuLSe*.**

The 'Rustici Pauperrimi': A Linnaean Myth about Lichens Rectified

Per M Jørgensen[1] & Robert Lücking[2]

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It has repeatedly been pointed out that Linnaeus had little interest in lichens (Krempelhuber 1867–72; Jørgensen 1999). This is not surprising since they do not have flowers, which were the basis of Linnaeus' plant classification system—he treated them more out of duty, as part of God's creation. This is reflected in the fact that he only included 109 species in his various works (Jørgensen *et al*. 1994), which is clearly fewer than what was known at that time (Krempelhuber op. cit.). Linnaeus' herbarium contains only 93 sheets of lichens that with certainty can be attributed to himself as the collector (Fig 1). His presumed characterisation of lichens as the "rustici pauperrimi", translated as *"the poor trash of Nature*" (Schneider 1897), has been cited in numerous papers (Hoffmann 1787; Wallroth 1825–27; Krempelhuber 1867–72; Schwendener 1869: Hellbom 1883; Flagey 1886; Jatta 1893; Britzelmayr 1906; Plitt 1919, 1927; Smith 1921; Räsänen 1951; Kantvilas 1983; Jørgensen *et al*. 1994; Galloway 2008). However, it appears that the idea that Linnaeus regarded lichens as *"the poor trash of Nature*" is a misconception and is probably a myth.

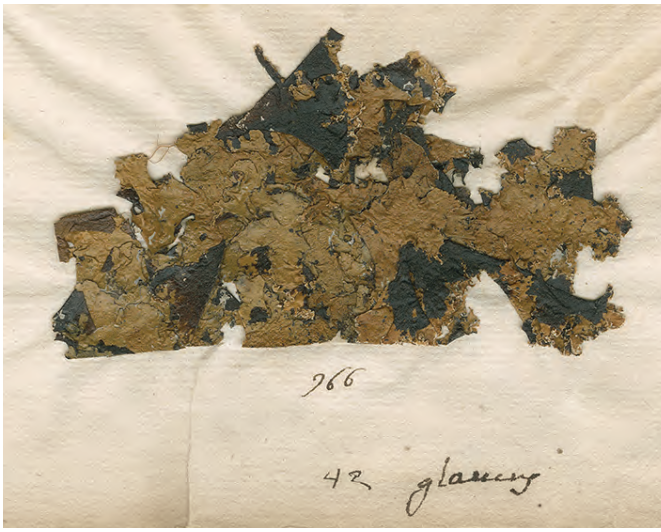


Fig 1 *Lichen glaucus* (= *Platismatia glauca*) in LINN, a lichen certainly collected by Linnaeus himself, inscribed by him with name and numbers from *Flora Suecica* and *Species Plantarum*

Linnaeus' true concept of lichens is documented in a text included in a thesis defended by Isaac J. Biberg in 1749 (Fig 2—*overleaf*) called 'Oeconomia naturae'. Biberg (1726–

1804) later (1750) printed a Swedish version (Fig 3). This was his own translation with some additions, which included an interesting Swedish subtitle. In translation this reads as follows:

> The Creator's omnisapient arrangements on our planet, as observed by the created objects' occurrence in the three Kingdoms, according to their reproduction, existence and destruction.

This sentence, although in the ungainly academic style of his time, nevertheless explains what the paper is all about: How to understand God's organisation of nature (see further in Hestmark 2000). There is no doubt that Linnaeus himself is the author of the thesis which was customary in those days, when the test to achieve a doctorate was to be able to defend a given text during a public oral examination (Fries 1906).

In paragraph X, 'Destructio', in the part treating the Plant Kingdom, we find some observations on lichens (Fig 4), which appear to have escaped the attention of later lichenologists except Hoffmann (1787: 18). Here, Linnaeus expresses his opinion on the role of lichens in nature. In translation it reads:

> What is it that is the basis of the black humus? This can be answered by the following observations: When rocks emerge from the deep sea, they are so smooth from the polishing water that only with difficulty can one stand upon them, as can be clearly seen on all beaches. However, eventually tiny plants, *Lichen crustacei*, settle on them. They have to be content with the few and tiny soil particles brought by the rain. Accordingly, these lichens prepare the ground for all plants and are for that reason, in spite of their modest appearance, quite remarkable in the economy of nature. After some time they produce a thin soil on which *Lichenes imbricati* settle. As soon as

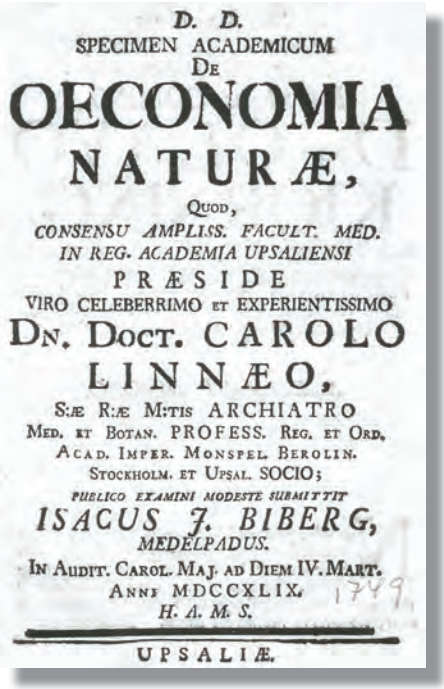

D. D.
SPECIMEN ACADEMICUM
De
OECONOMIA
NATURÆ,
Quod,
CONSENSU AMPLISS. FACULT. MED.
IN REG. ACADEMIA UPSALIENSI
PRÆSIDE
VIRO CELEBERRIMO ET EXPERIENTISSIMO
Dn. Doct. CAROLO
LINNÆO,
S:Æ R:Æ M:TIS ARCHIATRO
MED. ET BOTAN. PROFESS. REG. ET ORD.
ACAD. IMPER. MONSPEL. BEROLIN.
STOCKHOLM. ET UPSAL. SOCIO;
PUBLICO EXAMINI MODESTE SUBMITTIT
ISACUS J. BIBERG,
MEDELPADUS.
In Audit. Carol. Maj. ad Diem IV. Mart.
Anni MDCCXLIX.
H. A. M. S.
1749
UPSALIÆ.

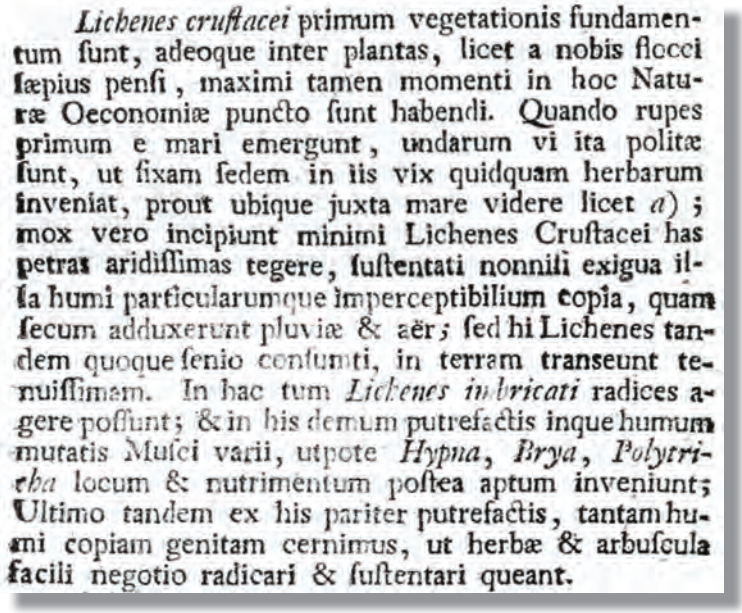
Fig 2 Title page of Biberg's dissertation


OECONOMIA
NATURÆ
Eller
SKAPARENS ALLVISA INRÄTTNING på vår jord, iagttagen vid de skapade tingens betraktande i de Tre Naturens Riken, till deras fortplantning, vidmagthållande och undergång;
Med Medicinska Facultetens bifall,
Under
KONGL. ARCHIATERNS,
Herr Doct. CARL
LINNÆI
Præsidio,
Utgifven uti ett Academiskt Snille-prof på Latin vid Kongl. Academien i Upsala år 1749. d. 4. Martii.
Och
Nu med någon tillökning på Svenska öfversatt
Af
ISAC J. BIBERG,
MEDELPAD.
Tryckt 1750.

Fig 3 Title page of Biberg's translation of the dissertation with some additions

Images: Courtesy Per M Jørgensen & Robert Lücking

Fig 4 The original text on p. 24–25, treating the role of lichens.



Lichenes cruſtacei primum vegetationis fundamentum ſunt, adeoque inter plantas, licet a nobis flocci ſæpius penſi, maximi tamen momenti in hoc Naturæ Oeconomiæ puncto ſunt habendi. Quando rupes primum e mari emergunt, undarum vi ita politæ ſunt, ut fixam ſedem in iis vix quidquam herbarum inveniat, prout ubique juxta mare videre licet *a*); mox vero incipiunt minimi Lichenes Cruſtacei has petras aridiſſimas tegere, ſuſtentati nonnili exigua illa humi particularumque imperceptibilium copia, quam ſecum adduxerunt pluviæ & aër; ſed hi Lichenes tandem quoque ſenio conſumti, in terram transeunt tenuiſſimam. In hac tum *Lichenes imbricati* radices agere poſſunt; & in his demum putrefactis inque humum mutatis Muſci varii, utpote *Hypna*, *Brya*, *Polytricha* locum & nutrimentum poſtea aptum inveniunt; Ultimo tandem ex his pariter putrefactis, tantam humi copiam genitam cernimus, ut herbæ & arbuſcula facili negotio radicari & ſuſtentari queant.

these decompose, several mosses, as *Hypna*, *Brya* and *Polytricha*, find space and sufficient nourishment. Their remains result in even more humus, so that larger herbs and trees finally without problems can take root. Their yearly shed leaves, rot and increase the amount of humus, as reported previously (in *Iter vestrogothicum*, p 185).

This brief text demonstrates that Linnaeus had an excellent insight into the function of lichens, being aware of their importance in nature as pioneer organisms in primary successions. He depicts them as modest plants that from nearly nothing prepare the ground for other plants. While Linnaeus' label of lichens as "rustici pauperrimi" has been widely cited since at least Hoffmann (1787: 17), we were unable to trace its origin and Linnaeus' known works definitely do not contain this term. Apparently Hoffmann was the first one to coin this phrase, and he may have heard it from his teacher D. von Schreber (1739–1810) who had studied in Uppsala, defending a thesis under Linnaeus (Kärnefelt *et al*. 2012). It is also possible that this is simply Hoffmann's interpretation of the cited text which he clearly knew and characterised as elegant (Hoffmann 1787: 18). Even if Linnaeus indeed once expressed these words himself, Wallroth's subsequent translation into "*das armselige Pöbelvolk der Natur*", which Krempelhuber (1867–72) endorsed, and later the "*poor trash of nature*" according to the German-American lichenologist Albert Schneider (Schneider 1897), is unfortunate. A more appropriate translation according to our colleague Hilary Birks in Bergen (pers. comm. 2017), could be "*the humblest peasants of nature*".

Based on the evidence brought forward here, we recommend that Linnaeus' view of lichens should be rectified and his presumed quote of the "rustici pauperrimi"—particularly its misleading translation—should be discontinued. It appears that, from early on, Linnaeus had a quite appropriate view of the importance of lichens in natural

ecosystems. He simply avoided treating them in detail, because they did not fit into his systematic concept of flowering plants.

REFERENCES

Biberg JI. 1750. *Oeconomia naturae…, nu med någon tilökning på Svenska övfersatt*. Uppsala.

Britzelmayr M. 1906. Lichenen aus Südbayern in Wort und Bild. Teil II. Fortsetzung der Lichenes exsiccati. *Berichte der Naturwissenschaftlige. Verein für Schwaben und Neuburg* 7: 179–228.

Flagey C. 1886. De l'autonomie des lichens et de la théorie algo-lichénique. *Revue Mycologique* 8: 5–14.

Fries Th M. (ed.) 1906. *Skrifter af Carl von Linné utgifna af Kungliga Svenska Vetenskapsakademien*. Stockholm.

Galloway DJ. 2008. Austral lichenology: 1690–2008. *New Zealand Journal of Botany* 46: 433–521.

Hellbom PJ. 1883. Norrlands lafvar. *Kongliga Svenska Vetenskaps-Akademiens Handlingar* 29(8): 1–131.

Hestmark G. 2000. Oeconomia naturae. *Nature* 405: 19

Hoffmann GF. 1787. Commentatio de vario Lichenum usu. *Mémoires couronnés, en l'année 1786, par l'Academie des Sciences, Belles-Lettres et Arts de Lyon, sur l'utilité des Lichens dans le médicine et dans les arts*: 1–60.

Jatta A. 1893. Materiali per un censimento generale dei licheni italiani. *Bulletino di Societa de Botanica Italiana* 1893: 106–120.

Jørgensen PM. 1999. The shaping of early lichenology: Linnaeus and his pupils. *Symbolae botanices upsalienses* 32: 11–21.

Jørgensen PM, James PW & Jarvis C. 1994: Linnaean lichen names and their typification. *Botanical Journal of the Linnean Society* 125: 261–465.

Kärnefelt I, Scholz P, Seaward MRD & Thell A. 2012. Lichenology in Germany: past, present and future. *Schlechtendalia* 23: 2–90.

Kantvilas G. 1983. A brief history of lichenology in Tasmania. *Papers and Proceedings of the Royal Society of Tasmania* 117: 41–51.

Krempelhuber A von. 1867–72. *Geschichte und Literatur der Lichenologie von dem ältesten Zeiten bis zum Schlusse des Jahres 1865* (resp. *1870*). München.

Linné C. von 1745. *Iter vestrogothicum*. Stockholm

Linné C. von 1749. *Oeconomia naturae*. Dissertation of I. J Biberg. Uppsala.

Plitt CC. 1919. A short history of lichenology. *The Bryologist* 22: 77–85.

Plitt CC. 1927. Succession in lichens. *The Bryologist* 30: 1–4.

Räsänen V. 1951. Suomen jäkäläkasvio. *Kuopion Luonnon Ystäväin Yhdistyksen Julkaisuja*, ser. A, 5:1–158, 16 tables.

Schneider A. 1897. *A textbook of general lichenology*. New York.

Schwendener S. 1869. Die Algentypen der Flechtengonidien. *Programm für die Rectoratsfeier der Universitaet*. Schultze Universitaetsbuchdruckerei, Basel. 42 pp, 3 plates.

Wallroth FN. 1825–27. *Naturgeschichte der Flechten* Vol. I & II. Frankfurt a. M.

The Linnean Society of London's Royal Charters

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The Linnean Society's first Royal Charter, granted in 1802, is both an historic record and an elegant work of art. Written on vellum, with elaborate calligraphy and fine decorative drawings, it bears the Royal Seal of the monarch in wax (the Great Seal of Great Britain and Ireland). Although also on vellum, the Society's two supplementary Charters (1904 and 2005) are comparatively plain and rather utilitarian. Transcriptions of these important documents are appended to our Bye-Laws, and sent in a 'welcome pack' to all newly elected Fellows, Honorary Members, Foreign Members and Associates. As a young, first year Ph.D. student in 1987 I received my copy, then printed in a distinctive, yellow-covered booklet. At the time I paid them scant attention, and simply felt honoured that I was a Fellow of a learned society with royal approval and illustrious origins. Such a reaction is probably not uncommon amongst the Fellowship, which is unfortunate as these documents lie behind the establishment of our Society and enshrine some of our long-standing traditions. Amongst other things, the charters define the name and purpose of the Society, the date of the annual general meeting (known as the Anniversary Meeting) as 24 May,[1] and the methods for the election of our Council and Officers.

Royal Charters—*A Definition*

A Royal Charter is a formal document, issued by the Privy Council on behalf of the sovereign as letters patent, granting rights or powers to an individual or legal body.[2] Our three Charters establish the basis for the organisation and governance of our Society, and are the ultimate reference to which the Bye-Laws, and the Society's other internal regulatory documents, are subordinate. It is therefore important to understand the provisions of the charters, but this is not straightforward as they are

1 24 May was taken to be the birthday of Linnaeus according to the Swedish New Style Calendar. It was later found to be a day out, the correct date being 23 May, but the Royal Charter was not changed and the Society still holds its Anniversary Meeting on 24 May, or as near as possible to that date.

2 The Privy Council was a body set up in the early days of the monarchy to advise the King or Queen on matters of state. Today it is comprised of cabinet ministers and a number of junior ministers.

Fig 1 The 1802 Royal Charter

couched in legal terminology, with virtually no punctuation or line breaks, and written in the archaic English used by the royal court. Furthermore, all Royal Charters are different, and one cannot infer comparison with other organisations. This article sets out to provide a background to the Society's Charters and a résumé of the provisions they contain.

The Linnean Society was founded in 1788. By the turn of the century, when membership had grown to over 200, the future constitution of the Society came under review. Some Fellows suggested a Deed of Trust, but the Society opted for incorporation by Royal Charter. At that time this was the sole means by which a group of individuals could be turned into a single legal entity with all the powers of a natural person: an incorporated body. For this reason Royal Charters were used to establish organisations such as cities, universities and learned societies.[3] Fellows donated £422 of the £450 5s· 6d· required (equivalent to about £32,000 today), and two legally qualified Fellows, William Mathews (Barrister of Middle Temple) and Stephen Claudius Hunter, with the assistance of Hunter's partner Henry Kebbit, gave their professional assistance in drawing up and obtaining the document. Coincidentally, another Fellow, George Legg, 3rd Earl of Dartmouth, was sworn in as a member of the Privy Council in 1801 and is named in the first Charter.

George III, the King in Council, "being desirous to promote every kind of improvement in Art and Sciences", formally recognised the Society with a *Royal Charter of Incorporation*, which was granted on 26 March 1802 (Fig 1). The objectives of the society were the **"cultivation of the science of natural history in all its branches, and more especially of the natural history of Great Britain and Ireland"**. The Charter also standardised the name as *The Linnean Society of London*, one of several variants used in preceding years. It conferred on the Society perpetual succession, and enabled the Society to hold property, to inherit legacies, to make legally binding contracts, to hire employees, and to be in a position to sue or be sued.

The enactment of the Royal Charter dissolved the existing Society and established a new body with 15 named Fellows, who had to act as the whole incorporated Society and form the first Council. There was much work to be done, including the formal election into the 'new' Society of all the members of the former. The 15 first met on 11 May 1802, and, in a rapid series of intensive meetings, they finished the appointment of the other Fellows and drafted the Bye-Laws in time for the first General Meeting

3 https://privycouncil.independent.gov.uk/royal-charters/chartered-bodies [Accessed 1 Jan 2018].

two weeks later. Altogether they elected 230 other Fellows, four Honorary Members, 81 Foreign Members and 38 Associates, making a total membership of 368.[4]

Amendments to the Bye-Laws of a body incorporated by Royal Charter would today usually require the approval of the Privy Council (though not normally of the monarch).[5] However, the Linnean Society's first Charter grants authority to the Society to make its own binding changes to the Bye-Laws, and defines the procedure for how this should be done.

On 24 May 1802 Council ordered the purchase of an iron chest as a secure repository for the Charter and other valuables. The Society's Iron Chest has three locks, each with a different key, one each to be held by the President, Treasurer and Secretary. Ever since that date the contents of the chest have been examined annually by Council, with a ceremony traditionally held on the day of the Anniversary Meeting. On the same day, the first General Meeting of the incorporated Society was held, in front of a large audience. The new Charter was read and the new Bye-Laws presented. The latter were finally passed at the fourth General Meeting on 6 July 1802.

In November 1802, the Society applied to the College of Arms for a grant of 'Arms, Crest and Supporters', with the motto *Naturae discere mores* ('to learn the ways of Nature'), a neat summary of the Society's aims. The Arms, granted in December, were based upon those which Linnaeus had suggested for himself in 1761, and are used in the 'Common Seal' of the Society. This colourful and beautifully decorated document bears three wax seals contained within ornate, round tin boxes, and is also kept safe in the Iron Chest.

Once incorporated, the Society surrendered some control of its internal affairs to the Privy Council. The Charter supersedes all other rules of the Society, none of which can legally contain anything that conflict with it. Nothing in the Charter can be suspended by the Society, unless the Charters give provision for this. Amendments can be made only with the agreement of the reigning monarch in Council, through the Privy Council. This has been done on only two occasions, at 100-year intervals: the 'Original Charter' was augmented by an 'Additional Charter' issued by King Edward VII on 8 April 1904, and by a 'Supplemental Charter' by Queen Elizabeth II on 14 July 2005.[6]

Changes to a Royal Charter are made by written Petition to the Privy Council with a payment of fees. Today the Privy Council requires a Petition to include the text of the proposed amendments themselves, a tracked-changes copy of the Charter demonstrating the amendments, and a note setting out their purpose and effect, and

4 In legal terms, the 'Members' are properly called 'corporate members' of the new incorporated body. These figures have been carefully prepared by David Pescod with reference to Council Minutes: the tally is two Members lower than those given by Gage & Stearn (1988: 23).

5 For an example see The Royal Society of Chemistry which was granted its Royal Charter in 1980, when it was formed as a learned society and professional body from the amalgamation of four existing societies (http://www.rsc.org/about-us/our-charter [Accessed 1 Jan 2018]).

6 An immediate amendment was needed to the 2005 Charter to correct errors in spelling. The amendment was granted on 19 July 2006, and is now kept in the same box case as that Charter.

the reasons behind the changes. The provisions of a Petition are first proposed by Council and then approved at a General Meeting (this process was formalised in the 2005 Charter, discussed below). The Petition for the 1904 Additional Charter was authorised by Council on 19 November 1903, with a copy of the printed Petition pasted into the Minute book.[7] The supplementary Charter was granted five months later at a total cost of £102 15s. 16d. (equivalent to about £10,000 today).[8] The Society did not need to use its own funds to pay for this second Charter, as a generous gift from the then Treasurer, Frank Crisp (later Sir Frank Crisp Baronet), covered the costs involved. The new Charter was read at the Anniversary Meeting, 24 May 1904, with the President, Professor Sydney Vines, moving a special vote of thanks to the Treasurer for his work and gift of the Charter to the Society (Fig 2).

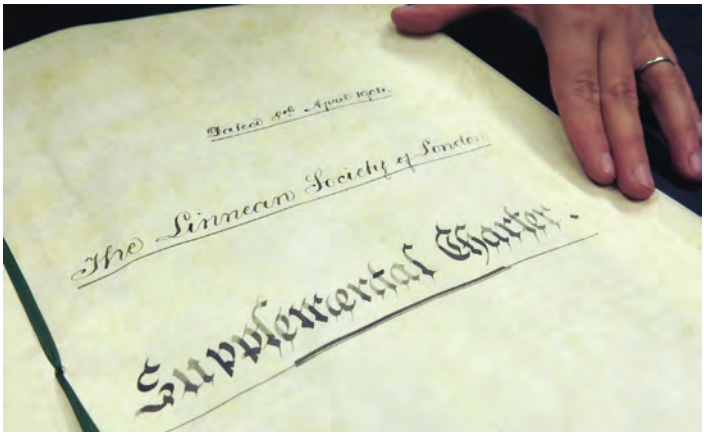

Fig 2 The 1904 Additional Royal Charter

Fig 3 The 2006 Supplemental Royal Charter

The decision to Petition for a third Charter was agreed by Council on 25 January 2005, with the aim to: enable the Society to take a lease from the First Secretary of State[9]; formalise the procedure for future modification of the Charters; and introduce numbering of the Articles. The Petition was approved by the Privy Council in time for the Anniversary Meeting that year, but the new Charter was not signed

7 A printed sheet tipped in between pp. 157 and 158 in Volume 8 of Council Minutes. The body of the Petition is repeated verbatim in the 1904 Charter.
8 Hand written on the first page of Proceedings 116th Session, LS Domestic Archives.
9 The Society's tenure at Burlington House was then in question, and the Society needed the option to lease the property from Government.

until 14 July, and was first shown to Council at their October meeting. Unfortunately, this new Charter had a number of grammatical and other drafting errors introduced by the Society's lawyers, which were subsequently spotted and corrected by David Pescod. Following the new procedures given by the new Charter, Council's proposal to amend it with these corrections was approved at a General Meeting on 2 March 2006. The Privy Council agreed to these changes on 19 July 2006 by issuing a statement to this effect under the seal of Her Majesty in Council (this document is now kept with the 2005 Supplemental Charter). The cost to the Society of this third Charter was £2,390, with the cost of the corrections borne by the Society's lawyers.[10]

The Three Royal Charters—*A Distillation*

A full transcription of the three Royal Charters, along with current version of the Bye-Laws, are available on the Society's website.[11] The following is a summary, in plain English, of the provisions ("presents" in the terminology used in the Charters), of the three combined into one. The year is given in square brackets when reference to a particular Charter is deemed necessary. The major changes to the original Charter made in the two later Charters are discussed below.

Title

The Linnean Society of London.

Purpose

The cultivation of the science of natural history in all its branches, and more especially of the natural history of Great Britain and Ireland.

Legal Status

The Society is incorporated as a body politic and corporate, with perpetual succession.

The Society has the power to purchase, receive, or possess any personal goods, and to purchase or hold land property.

The Society may enter into, or be subject to, litigation: it can sue or be sued; it can engage in legal actions, suits and cases; and it can be called to defend itself in court.

The Society is granted the use of a Common Seal (Company Seal) which, when attached to a document, signifies that it is a legal act and deed of the Society. The Society has the power to change or alter its Common Seal.

Governance

A Council, which includes the Officers (President, Treasurer, and at least one Secretary [1904]) will direct, manage, and execute the business of the Society.

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10 Personal Communication from the Financial Controller, Priya Nithianandan, 4 December 2017.
11 https://www.linnean.org/the-society/governance-1 [Accessed 1 Jan 2018]. The Royal Charters are also available here: https://ca1-tls.edcdn.com/Charter-and-Byelaws-2016-Final-24May2016.pdf?mtime=20160916102354 [Accessed 1 Jan 2018].

Council should consist of 20 members to be elected from Fellows.[12] Quorum at a meeting of Council is five members [1904].

Council is responsible for:

- Establishing and revising the Bye-Laws of the Society;
- Setting dates and venues for meetings of the Society;
- Organising the election and ejection of Fellows, Honorary Members, Foreign Members and Associates. Checking qualifications of persons to be admitted and monitoring the payment of fees;
- Organising the annual removal and election of Council members;
- Organising the election of the President, Treasurer and Secretaries;
- Appointing subordinate Officers and staff ('Attendants and Servants') for the year ensuing, as necessary for transacting the business and concerns of the Society;
- Filling vacancies for the above as caused by death or otherwise.

Elections for Council are conducted by ballot at a meeting held once a year on or around 24 May at a regular Society meeting room. If this date falls on a Sunday or Bank Holiday then it is held on another day within the same week as fixed by the President [1904].

One quarter, and no more, of Council members should retire each year at the Anniversary meeting [1904].

At the Anniversary Meeting, 21 or more Fellows must be present to:

- Determine which any five existing Council members will retire;
- Elect five other Fellows to fill the vacant positions on Council;
- Elect, from Council members, two people as the President and Treasurer for the ensuing year;
- Elect, from Council members, one or more people as the Secretary or Secretaries for the ensuing year [1904].

If a Council member dies then a replacement can be appointed, in a like manner, at a general meeting within six months of the death [1904].

The President can appoint four Vice-Presidents for the ensuing year selected from members of Council.

Membership

The maximum number of Fellows, and the number of Fellows to be annually elected, is to be set in the Bye-Laws [1904].

Society Fellows, when 11 or more are present at a general meeting, may elect or eject, without distinction of sex [1904], Fellows [including Fellows *honoris causa*], Honorary Members, Foreign Members, and Associates [including Student Associates].

Bye-Laws

Council has the power to vary, alter, revoke or make new Bye-Laws such as they deem useful and necessary for the regulation of the Society and of the Society's property and

12 In relation to Charity Law, Council members are Trustees of the Society.

business. These changes may not contravene what is set out in the Royal Charters or UK law.

Changes to any Bye-Law as approved by Council must then be displayed in a Society meeting room and read by the President, or a Vice-President, at two successive general meetings of the Society. If changes are then approved by a two-thirds majority, in a ballot of at least 11 Fellows, at the next general meeting of the Society, then they are considered to have passed and be binding on the Society.

Procedure for Changing the Royal Charters

Council may propose to revoke, amend or add to the three Royal Charters in a resolution that has been passed by two-thirds of Council members present, as long as this is an absolute majority of the total number of Council members. This resolution must then be confirmed by a resolution passed by two-thirds of Society members present at a general meeting held one to four months afterwards [2005].

Any changes to a Royal Charter must then be approved by the Privy Council in Westminster before they can take effect [2005].

No change can be made which causes the Society to cease to be a charity in Law [2005].

Amendments to the 1802 Royal Charter

In June 1902, almost exactly 100 years after the granting of the first Royal Charter, the Council of the Linnean Society formed a *Charter Committee* to consider whether any alterations in or additions to the Charter were desirable, and if so, what they should be. The Committee consisted of the Officers, Thomas Stebbing and Herbert Druce, who submitted their report in July.[13] The report was considered at a Special Council on 4 December 1902, where it was agreed that an Additional Charter would be requested to include a number of significant changes to the Fellowship and to Council.[14]

Admitting Women Fellows

Until the end of the 19th century the Society had largely excluded women, as Council viewed that "it was more than doubtful whether the Society's Charter could be held to apply to women".[15] Only a handful of women were allowed to attend meetings, as this was considered "contrary to custom". This was about to change, and despite the Society's inertia on the admittance of women, the perseverance of Mrs Marian Sarah Ogilvie Farquharson and her supporters would eventually win through. Although the election of women as Fellows would not have been a consideration when the Charter was written, there is no expressed discrimination against them: the Charter says that "persons" can be elected Fellows, Honorary Members, Foreign Members and

13 Linnean Society Domestic Archives, Council Minutes Book 8, p. 4.
14 Linnean Society Domestic Archives, Council Minutes Book 8, pp. 20–21.
15 Gage & Stearn (1988: 88-93) give a detailed and illuminating account of the admission of women into the Society.

Associates. The difficulty was that women were not 'persons' in the legal sense, and in 1901 professional advice was that these terms precluded the admission of women. However, the case for admitting women continued to be pressed, a Special Council held on 4 December 1902 considered the question of the admission of women, and in 1903 Society members voted at a Special General Meeting to petition for a change in the charter which would expressly allow lady Fellows. The 1904 Additional Charter allowed for the Society "to elect such persons without distinction of sex to be Fellows", and the Bye-Laws were revised accordingly. On 17 November 1904 the first women were presented for election as Fellows, with 15 of the 16 elected on 15 December: after all she had done to promote women in science, it was disgraceful that Mrs Farquharson was blackballed. The first formal admission of women to the Fellowship took place a month later, on 19 January, when 11 ladies signed the *Book of Admission and Obligation*. Of these pioneers, the most distinguished in natural history were Miss Annie Lorrain Smith, who worked on seaweeds, fungi and lichens at the British Museum (Natural History), authored the standard *Handbook of British Lichens*, and for ten years was President of the British Mycological Society (1907–17), and Miss Emma Louise Turner, an accomplished bird photographer, ecologist and author.[16]

Limiting the Number of Fellows

The original Royal Charter declared that there should be an indefinite number of Fellows, and gave no power to limit the number of elections to be held in a season. This was remedied by the 1904 charter which gave authority to the Society to use its Bye-Laws to set the maximum number of Fellows, and to determine the number of Fellows to be annually elected. However, it was not until the 18 March 1920 version of the Bye-Laws that the first limitation of the number of Fellows to 710 was made. This limit was raised to 800 two years later (30 November 1922) when the financial implications became apparent, and on 25 March 1943 this was raised again to 1,000 Fellows. Later, complete flexibility was achieved with Bye-Law 1.1 stating that 'the limit of the number of persons to be elected shall be determined from time to time by Council'.[17] At present there are no restrictions on the number of ordinary Fellows or Associates, nor the number of these that can be elected each year. Whereas Bye-Laws 3 and 4 limit the number of Honorary Members to four (excluding members of Royal Families), Foreign Members are capped at 50, and Fellows *honoris causa* at 25.

Expanding Council

The original charter established a Council of 15 members, listed the founding members, and named the first President, Treasurer, and Secretary. The Additional Charter, granted in 1904, expanded Council to 20, with the one-off election of an additional five members to fill the new seats. Although it is not mentioned in the

16 Mrs (later Lady) Catherine Crisp, wife of the Treasurer Frank Crisp, was also among the first group of women to be admitted. She is featured receiving the hand of Fellowship from the President, WA Herman, in a painting by James Sant to celebrate the event, commissioned and paid for by her husband. On the death of Frank Crisp, following his wishes, Lady Crisp presented this large painting to the Society, and it is currently on display in the stairwell of the Society's rooms at Burlington House (see *The Linnean*, 1: 10. 1984).

17 Gage & Stearn (1988: 196).

Council Minutes, this increase in size was presumably to ensure that sufficient members existed to undertake membership of the various committees and subcommittees, without putting too much work on just a few members. In order to keep the number of Council members changed at an Anniversary Meeting to five, the new charter required a quarter (not a third as in the original charter) of members to retire annually. Quorum at Council remained unaltered at five. Reflecting the importance of Council elections, the number of Fellows that was needed to elect Council members, and appoint Officers at an Anniversary Meeting, was raised from 11 to 21. Bank holidays were added to the days on which an Anniversary Meeting could not be held, and, if the 24 May fell on a prohibited day, then the President was given the responsibility to select a date during the week following.

Increasing the Number of Secretaries

In less than a decade of its incorporation, the 'new' Society found the provision of just one Secretary insufficient to cope with the increasing workload, and the honorary office of Under-Secretary was added in 1810. In 1861, the posts of Secretary and Under-Secretary were abolished and replaced by Botanical and Zoological Secretaries. On each of these occasions the Bye-Laws were changed to accommodate these new, altered or cancelled positions, even though strictly these were contrary to the Royal Charter. This unsatisfactory situation was remedied in the 1904 Additional Charter with the insertion of the words "at least one" before Secretary in the listing of Officers.

Up until 1958, responsibility for the Society's publications rested with the overloaded Botanical and Zoological Secretaries, sometimes causing unacceptable delays. The solution was to appointment another Secretary, the Editorial Secretary, who chaired the newly formed Editorial Committee. The post of Collections Secretary was created in 2003, with the bringing together of the Collections Committee and the Library Committee. It was seen that much of their remit overlapped, with the Collections and Library elements complementing each other. It was also recognised that the Collections are fundamental to the remit of the Society and needed a voice on Council. In 2012, the distinction of Botanical and Zoological Secretaries was scrapped, replaced by two Scientific Secretaries, as it was felt that the traditional division between disciplines did not reflect our present understanding of the natural world.

There are currently four honorary Secretaries: two Scientific Secretaries (one in charge of Programmes and the other Education & Public Engagement), an Editorial Secretary, and a Collections Secretary. These posts are all honorary positions and the holders chair the respective Committees. In contrast, the Executive Secretary is a salaried post established by the Bye-Laws in 1966 with the task of implementing the decisions of Council, replacing the former roles of the Assistant-Secretary and General Secretary.

Extending the Time Period for Replacing Deceased Members of Council

The first Royal Charter stipulated that on the death of a Council member, a replacement should be elected within three months. On occasion this caused a problem, as if the demise occurred just before the summer recess, holding a quorate General Meeting could be difficult as Fellows would not normally meet for at least three months.

Along with the London aristocracy, those who could would escape the city in the heat of the summer to enjoy the refreshing country air. The death of Former President Robert Brown, then a member of Council, on 10 June 1858 presented such a problem. The last general meeting of the session would have been 17 June, but, in respect to the great botanist, business was adjourned without any papers being read. Council instead decided to prolong the session by adding an extra meeting on 1 July to elect his replacement. Although an inconvenience to some, this also proved to be a historic, ground-changing meeting, for here the papers of Darwin and Wallace on evolution by natural selection were read. In the 1904 Royal Charter the replacement period was extended to six months, which dealt with the issue of the summer recess, and gave more time to find and elect a suitable replacement.

Removing the Statutes of Mortmain

The 2005 Supplemental Charter introduced a number of formatting changes numbering the articles, and also the removal of the references to the Statutes of Mortmain. Edward I initiated these 13th-century statutes in order to preserve his kingdom's revenues by re-establishing the prohibition against donation of land to the Church. Possession of property by a corporation, such as the church, was known as mortmain ('the dead hand'), as the organisation never died and so would never pay inheritance or other property transfer taxes. The Statutes stipulated that no estate should be granted to a corporation without royal assent. The 2005 Charter deleted references to these arcane statutes, and removed all other restrictions on the Society owning property. This was essential as the Society had an immediate need to enter into a rental agreement to stay at Burlington House, and enabled the Society to buy Toynbee House.

Amending the Royal Charters

The process for amending the Bye-Laws was laid out in the original charter, but not that for altering the Royal Charter itself. The 2005 charter addressed this by providing the mechanism by which the Society could propose changes, and the Privy Council would decide on including them in future Royal Charters. This, and the removal of the Statutes of Mortmain references, made in the 2005 Supplemental Charter, are mirrored in similar charters granted at the same time to the three Burlington House Courtyard societies which have Charters dating back to the 18th or early 19th century: The Society of Antiquaries of London (incorporated by Royal Charter in 1751); The Geological Society of London (1825); and The Royal Astronomical Society (1831).

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A Garden of Ideas: The Jardin des Plantes, Paris

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Tucked away in the fifth arrondissement of Paris, between the Rue Geoffroy-Saint-Hilaire and the River Seine, stands a botanic garden which has long nurtured the great minds of art, botany and chemistry. The *Jardin des Plantes* has survived war, revolution and neglect and earned a place in the pantheon of great European gardens.

The *Jardin des Plantes* was originally conceived in 1626 when Paris was at the centre of an exciting scientific revolution (Barthélemy 1979). To meet France's emerging research needs a *Jardin Royal des Plantes Médicinales* was proposed by King Louis XIII's physician Guy de La Brosse (1586–1641). By 1635, a plot of land in the district of Saint Victor, overlooked by a grand château, was purchased by the King and began serving as a medicinal plant garden to the *Université de Paris*—before opening to the public in 1640 (Fig 1). By 1641 the garden held 2,360 plants (Bernard *et al.* 1842).

Funding for the project had been approved by a royal decree of 1633 and an annual stipend of 24,000 French *livres* would pay for the purchasing of drugs and the salaries of a director (*surintendant*); three demonstrators (*démonstrateurs*); a sub-demonstrator (*sous-démonstrateur*) and laboratory assistants (*garçons servants*). These arrangements would remain largely in place until the French Revolution, some 160 years later, with the King's physician usually assuming the prestigious position of garden director.

Fig 1 Painting by Frédéric Scalberge (1542-1640) of the *Jardin Royal des Plantes Médicinales* in 1636, shortly after its inauguration

By the late 1660s England and France had established scientific societies (The Royal Society in 1660 and the *Académie des sciences* in 1666, respectively). As Paris' scientific reputation grew, the *Jardin Royal* began to outshine its rival at the University of Montpellier, whose much smaller medicinal garden had been created in 1593.

Meanwhile, in nearby Versailles the King's principal gardener and landscape architect André Le Nôtre (1613–1700) began work on gardens which would eclipse anything yet seen in Europe—a hugely influential example of the symmetrically arranged *jardin à la française*, or French formal garden.

Following the death of the *Jardin Royal's* original champion, Guy de La Brosse, administrative control of the gardens passed to the minister of finance Jean-Baptiste Colbert (1619–83) and its directorship, briefly, to Scottish physician William Davisson (c. 1593–1669),[1] until 1693, when Guy-Crescent Fagon (1638–1718) became director. Fagon was de La Brosse's nephew and author of *Fagonia* (a genus in the caltrop family). Up until his death in 1718, Fagon brokered an uneasy truce with the nearby *Université de Paris* which was apparently perturbed by the competing activities of the garden's physicians (Jacques 1997).

Fagon's directorship coincided with a period during which French botany flourished. The botanist Joseph Pitton de Tournefort (1656–1708) travelled throughout the French colonies, gathering a vast herbarium of tropical species, many of which featured in his *Elémens de botanique* (1694)—a work credited with introducing the concept of plant genus. Fagon commissioned the building of a 600-seat amphitheatre for the teaching of chemistry and the first glasshouse in the garden was completed in 1714, to house a coffee plant given to Louis XIV by the mayor of Amsterdam.

After a royal proclamation in 1718, the garden became simply the *Jardin du Roi* (or *King's Garden*) paving the way for the expansion of its research into other areas of natural science such as anatomy and zoology. Fagon's successors, namely Pierre Chirac (1650–1732) and Charles François Cisternay du Fay (1698–1739) assembled a team of scientific talent to build on his legacy. Chirac was accused by some of favouring medicine over plants, but du Fay was hailed for his transformation of the garden into one of the most beautiful in Europe.

However, it was not until 1739, under the charismatic Georges-Louis Leclerc (1707–88), later Comte de Buffon, that the garden was significantly expanded to occupy its current site of approximately 65 acres (26 hectares). The magnificent temperate glasshouses were erected in 1788, along with a maze and metal gazebo (the *Gloriette de Buffon*) adding a touch of whimsy to the garden's regal splendour. Buffon's 36-volume *Histoire Naturelle* (1749–1804) would cement his legacy as one of the great European naturalists. In his wake, illustrious visitors flocked to the gardens, from across Europe, including Carl Linnaeus (1707–78) and Alexander von Humboldt (1769–1859), a Prussian émigré to Paris whose exotic botanical specimens formed the subject of popular exhibitions in the garden's public galleries.

Fig 2 The cedar of Lebanon presented to Bernard de Jussieu by Peter Collinson and planted in 1734

In 1734, as the second Hundred Years' War (c. 1689–c. 1815) rumbled on, one of the garden's sub-demonstrators, the retiring Bernard de Jussieu (1699–1777), was presented with a cedar of Lebanon (*Cedrus libani* A. Rich.) sapling by the noted English horticulturalist Peter Collinson (1694–1768). This tree, as legend would have it, was brought back from England by de Jussieu in his hat. It survived and can still be found in the garden today (Fig 2).

Bernard's nephew, the more ambitious Antoine-Laurent de Jussieu (1748–1836) became professor of botany at the gardens in 1770. His 'natural' classification system, based on unpublished work by his uncle Bernard, in turn inspired by the ideas of Joseph Pitton de Tournefort, was consolidated into his seminal work *Genera plantarum* (1789), which is said to have influenced the zoological classification system of Georges Cuvier (1769–1832). Over 60 plant species were named for Antoine-Laurent de Jussieu and his order beds are still in place in the garden.

In 1792, just a year before the The Reign of Terror began, the *Royal Ménagerie* was, perhaps presciently, brought over to the *Jardin du Roi* from Versailles where it still exists as the *Ménagerie du Jardin des Plantes*. Meanwhile, chemistry was flourishing under the watchful eye of botanist André Thouin (1746–1824). Antoine-Laurent de Lavoisier (1743–94) who had studied at the *Jardin des Plantes* with Guillaume François Rouelle (1703–70) would later, with Thouin and his colleagues Hassenfratz, Fourcroy, Desfontaines and Berthollet, present a "simplified photosynthesis" to the *Académie des sciences*. Jean-Baptiste Lamarck (1744–1829), whose ideas of "soft inheritance" pre-figured Darwin's evolutionary theory, was appointed chair of botany in 1788.

The *République française* would tear apart this innovative research circle. On 8 August 1793, all the learned societies, including the *Académie des sciences*, were suppressed at the request of revolutionary leader Abbé Grégoire (1750–1831). De Lavoisier met his fate at the guillotine in 1794, charged with adulterating tobacco, a sentence from which he was posthumously exonerated. Others were luckier: for example the zoologist Etienne Geoffroy Saint-Hilaire (1772–1844) was sent to Egypt with Napoleon's scientific expedition (1798–1801) and amassed a sizeable haul of important botanical and zoological specimens to augment the Museum's collections on his return to Paris in 1802.

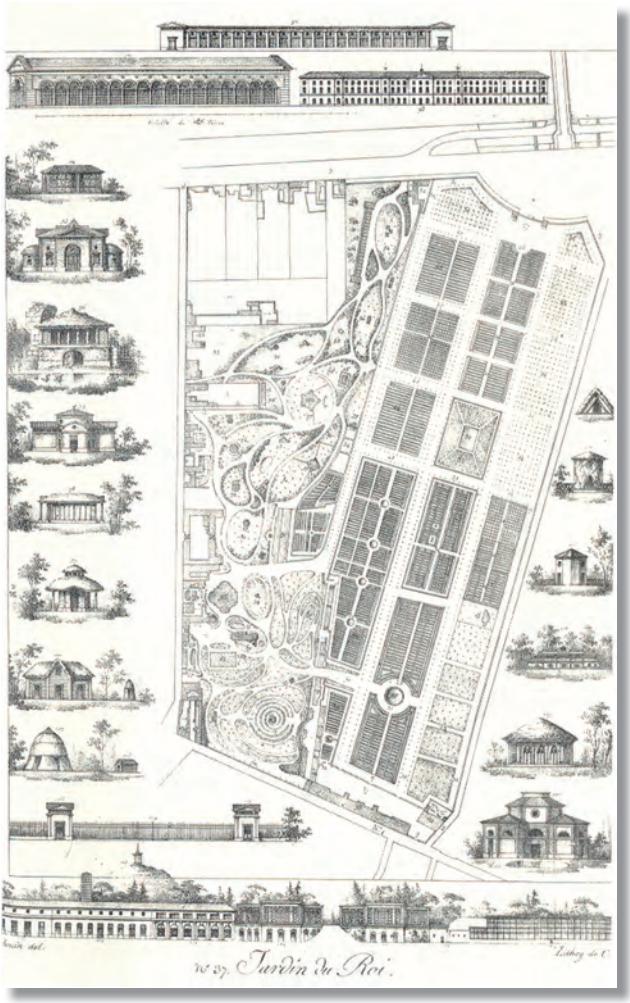


Fig 3 Gabriel Thouin's unrealised plans for the *Jardin de Plantes* from *Plans raisonnés de toutes les espèces de jardins* (1820), pl. 37

Arguably, the most profound consequence of the Revolution for the *Jardin du Roi* was its transformation, through the *Assemblée Nationale*'s decree of June 1793, into the *Muséum National d'Histoire Naturelle*. Louis-Jean-Marie Daubenton (1716–1800), a provincial doctor who had risen from obscurity under de Buffon, became its first director, while Jean-Baptiste Lamarck became professor of zoology. It was at this point that the garden would become known as the *Jardin des Plantes*, permanently severing ties with its royal past.

Plans from 1820 by Gabriel Thouin (brother of André Thouin) depict a neo-classical architectural aesthetic (Fig 3) which Rohault de Fleury's extraordinary Mexican glass house (1834–36) would challenge, but the *Jardin des Plantes* nevertheless retained its old world charms; novelist Victor Hugo's *Poème du Jardin des Plantes* (1877) describes it as an "Eden" where the flowers "gleam".

One of the legacies of France's exploits in the Americas was a striking array of new and exotic species to study. In 1820, the pharmacists Joseph Pelletier (1788–1842) and Joseph-Bienaimé Caventou (1795–1877) famously isolated the antimalarial alkaloid quinine from *Cinchona* bark in their Parisian laboratory, following their isolation of chlorophyll in 1817. A letter, dated November 1847 from the Irish geographer J B Pentland (1797–1873) to the director of the Royal Botanic Gardens, Kew, Sir William Joseph Hooker (1785–1865), records that *Cinchona* sown in the gardens had "come up" and "was flowering". Kew's archives reveal other American species which had arrived at the gardens, evidenced by the donation to Kew in 1899 of the bark of *Sagotia racemosa*, an aphrodisiac plant native to Brazil from a "M Cornu".[2]

War continued to rage throughout Europe, leading to some serious consequences for the *Jardin des Plantes*. From September 1870 to January 1871, Paris came under siege by the Prussian army and in January 1871 the grand glasshouses were damaged by the Prussian bombardment. Castor and Pollux, two prize elephants in the *Menagerie* were killed and their meat sold to the *Boucherie Anglaise* for the sum of 27,000 francs. An unfortunate English visitor commented:

> Yesterday, I had a slice of Pollux for dinner. Pollux and his brother Castor are two elephants, which have been killed. It was tough, coarse, and oily, and I do not recommend English families to eat elephant as long as they can get beef or mutton.

By May 1871 peace was restored. Evidence of *détente* appears in a letter, dated January 1873, from Charles Sprague Sargent (1841–1927) of Massachusetts, director of Harvard's Arnold Arboretum to Kew's Sir Joseph Dalton Hooker (1817–1911), which recalls the dispatch of a box containing "about 33 pounds of acorns of *Quercus densiflorus* (*Quercus densiflora*?)" from California which, at the suggestion of Dr Asa Gray (1810–1888), he asks Hooker to "divide with the *Jardin des Plantes* at Paris".

"It was tough, coarse, and oily, and I do not recommend English families to eat elephant as long as they can get beef or mutton."

In July 1889, the year of the Paris Universal Exhibition, the *Gallerie de Zoologie*, a formidable 30 metre tall glass-roofed edifice, was opened at the garden's western perimeter on the site of the old château. From its upper windows one could look out across the *Jardins de la Perspective* to the banks of the Seine. The year 1900 saw another universal exhibition in Paris celebrating the new century and the *Art Nouveau* style, which would imprint itself on the gardens.

An alpine garden was added in 1931, containing over 2,000 species of mountain plants. In the same year the Paris Metro arrived at rue Jussieu. A tropical greenhouse, 55 metres long, designed by René Berger was erected in 1937. From 1942 to 1943, while Paris was occupied by the Nazis, the great photographer of Parisian life, Robert Doisneau (1912–44) documented the daily workings of scientists in the city's natural history museum, illustrating the *Jardin des Plantes* continuing resilience in the face of war.

In 1964, as France's post-war economy revived, the Dutch-style *Jardin des Vivaces* was unveiled in the garden. Planted with 150 varieties of *Iris*, it was the result of careful selection and hybridisation of European and North African varieties, alongside 450 other perennial species. The *Gallerie de Zoologie*, which had lain dormant for almost 30 years, was restored and reopened in 1994 together with a new rose garden. In 2005, the historic glasshouses, which had endured centuries of weathering, were entirely renovated and redeveloped, re-opening their doors to the public in 2010.

Today the *Jardin des Plantes* and the *Muséum National d'Histoire Naturelle* remain a popular destination for students and tourists and the headquarters of a scientific research institution spanning 12 sites throughout France. Lacking the grandeur of Versailles, the *Jardin des Plantes* may have suffered from being something of a 'jack of all trades', but it has surely earned a place in the annals of science, emerging with a reputation perhaps less impressive than the sum of its parts.

Without the radical ideas of Bernard and Antoine-Laurent de Jussieu on the nature of plant families or the insights into plant respiration and evolution heralded by Antoine-Laurent de Lavoisier and Jean-Baptiste Lamarck, today's understanding of plant life might be drastically different. A quick survey of its elegant statuary reminds us just what a pivotal role the *Jardin des Plantes*'s luminaries have played in the development of modern botany and the natural sciences.

Notes

1. The Aberdonian doctor William Davisson (originally Davidson) migrated to France in 1614. A committed Paracelsian, Davisson became King Louis XIV's physician in 1644.
2. This entry may refer to Marie Maxime Cornu (1843–1901) a botanist and mycologist who was *aide-naturaliste* at the *Muséum National d'Histoire Naturelle* before becoming lecturer of botany in 1876 and chair of horticulture from 1884 until his death. He is noted for defining the genus *Schoenlandia* (Tecophilaeaceae).

ACKNOWLEDGEMENTS

Thanks are due to Gina Douglas, Emma Durrant, Professor Michael F Fay and Christina Harrison.

REFERENCES

Barthélemy G. 1979. *Les Jardiniers du roy: Petite histoire du Jardin des plantes de Paris.* Paris: Diffusion Librairie Du Muséum.

Bernard P, Couailhac L, Le Maout E, Gervais P & Curmer L. 1842. *Le Jardin des plantes: description complete, historique et pittoresque du Muséum d'histoire naturelle*. Paris: L Curmer.

Christenhusz MJM, Fay MF & Chase MW. 2017. *Plants of the World.* Kew: Kew Publishing. (P 349.)

Hugo V. 1877. *L'Art d'être grand-père.* Paris: Calmann-Lévy, éditeurs. (Pp 63–108.)

Jacques R. 1997. *Buffon: A Life in Natural History.* Ithaca: Cornell University Press.

Jussieu A-L de. 1789. *Genera plantarum.* Paris*:* Herissant*.*

Tournefort JP de. 1694. *Elémens de botanique*, Paris: de l'Imprimerie Royale.

Links [Accessed January 2018]
Kew Archive:
http://www.calmview.eu/Kew/CalmView

Kew Economic Botany Collection:
http://apps.kew.org/ecbot/search

Jardin des Plantes Website:
http://www.jardindesplantes.net/fr

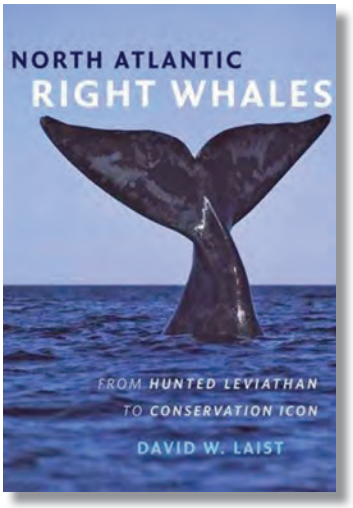
Peter S B Digby (1921–2017): Dr Peter S B Digby FLS, a Fellow since 1961, served on the Council of the Society from 1962–64. A respected zoologist and professor, he died peacefully on 24 December at age 96. Following graduation from Cambridge in 1942, he worked on insect crop pests, as part of efforts to increase wartime food production. In 1950–51, he and his wife Vi worked in Greenland studying zooplankton, work that involved mastering dogsledding and blasting holes in winter sea ice. The results were landmark scientific understanding of plankton lifecycles and an engaging book, *Beyond the Pack-ice* (1954). In 1967 he left his lecturer post at St Thomas's Hospital in London and emigrated with his family to Montreal. As Professor of Zoology at McGill University he specialised in marine physiology and calcification. He is remembered by students as a kind and encouraging teacher, a very modest man who went to great efforts to stimulate thinking and curiosity.

James W T Moody (1937–2017): Prof James W T Moody FLS passed away in Saulte Ste Marie, Michigan, US on 7 December, aged 80. Born in Rockford, Illinois, Professor Moody attended Greenville College and earned his BA in 1959, and his MA from Michigan State University in 1960. He left MSU in 1967 having reached ABD status with his Ph.D. From 1971 he taught at Lake Superior State University, Michigan, where he became an important figure and supporter of the students and junior faculty. He was elected a Fellow in 1963 and was a regular visitor to the Society for many years, becoming a personal friend of the late Mr Theodore O'Grady (Executive Secretary of the Society, 1966–79 and General Secretary, 1951–66) as well as Prof William Stearn and his family, maintaining many links until the time of his death. He presented the Society with the plaster replica of George Bullock's bust of Sir James Edward Smith, cast from the original and now on display in the Library Annexe.
http://www.legacy.com/obituaries/sooeveningnews/obituary.aspx?n=james-wt-moody&pid=187496146&fhid=21072

Bill Sykes (1927–2018): We recently received the sad news of the death of a recently elected Foreign Member, William Russell 'Bill' Sykes FMLS, who was born in Walsham-le-Willows, Suffolk, UK, and passed away in Christchurch, New Zealand on 5 January. Bill was formerly a botanist at the Department of Scientific and Industrial Research (DSIR) Botany Division at Lincoln (now the Allan Herbarium, Manaaki Whenua Landcare Research). He previously published *Contributions to the Flora of Niue* (1970) and works on the flora of the Norfolk and the Kermadec Islands. He was a co-author of the 1988 *Flora of New Zealand* series volume on naturalised plants of New Zealand, and contributed the section on bamboos to the volume on grasses in 2000. Sykes was made an Officer of the New Zealand Order of Merit (ONZM) in recognition of his work.

Book Review

North Atlantic Right Whales: From Hunted Leviathan to Conservation Icon



David W Laist

464pp, Baltimore: Johns Hopkins University Press, 2017, hardback. Mono and colour illustrations. £33.50
ISBN 978-1-421-42098-1

"Today, historically based perspectives are often overlooked […] by biologists and resource managers trying to ensure the survival of rare and endangered wildlife" (p. ix). David W Laist seeks to add this historical perspective to current conservation. In 22 chapters, he captures the fascinating story of the North Atlantic Right Whale, particularly in relation to Homo sapiens, starting from the first written records and associated artefacts.

As a leading scientist at the US Marine Mammal Commission, the author is well-placed to provide close insights into the work and history of the Commission. His first-hand accounts of whale rescue missions and protection measures are particularly gripping and relevant, and this personal angle is the great strength of his book.

Also invaluable is Laist's expertise in the taxonomy, biology and behaviour of whales and the complexities of closely-related populations, their interactions and migrations. His expertise is presented as hard science, but is still engaging for the interested layman.

The chapters on the science and conservation of whales provide a framework for the middle part of the book, which is dedicated to the history of whaling and other encounters of humans and whales, from prehistory to modern times. For readers who eagerly devoured Philip Hoare's excellent books on whales and whaling (*Leviathan or, The Whale*, 2008; and *The Whale: In Search Of The Giants Of The Sea*, 2010), as well as serious connoisseurs of Herman Melville's *Moby Dick*, this may turn out to be the weaker part of the Laist's book. Although meticulous, while it provides a good overview and highlights of little-known documents and artefacts (many in high-quality black-and-white or coloured illustrations), it lacks the breath-taking cultural contextuality and engagingly quixotic style that turned whales into such wonders for readers of the aforementioned titles.

For the conservationist and scientist, however, this more factual and methodical overview of historical sources may obviously be of much greater practical use, fulfilling the aim of the author. Especially interesting is how Laist attempts to draw conclusions on the North Atlantic Right Whale population developments over the centuries by looking at figures recording the oil obtained from whales killed. He also recounts what is perhaps the first historical account of a whale becoming entangled in fishing

equipment, which makes a poignant connection to the rescue of the whale 'Nantucket' in the first chapter.

One problem with early historical sources is of course the difficulty of determining the exact type of whale mentioned, which makes keeping the focus on one particular species very difficult. But there are interesting insights to be had from looking at these sources through an expert's eye, who really knows his North Atlantic Right Whales. The excellent bibliographic notes, references and index are a clear bonus. Personally, however, I would have wished for more of a voyage of discovery across archives, libraries and museums, bringing to light previously unpublished primary sources.

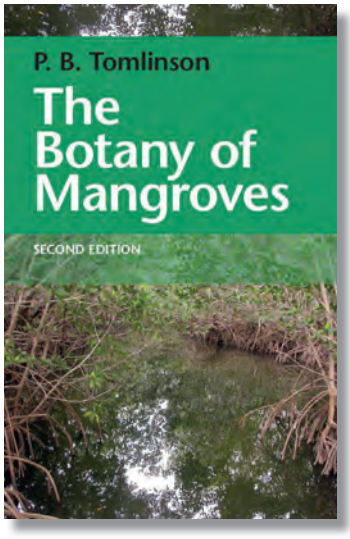
Laist concludes that "[f]ew marine species have influenced the course of human history and our relationship with the sea as much as the North Atlantic Right Whales". This book does more than justice to these magnificent animals, particularly in its emphasis on first-hand, hands-on, science, conservation, education and political activism. It is part of a mission to find new ecosystem management principles, and insists that this end cannot be achieved through the sciences alone, but must be underpinned by knowledge gained from historical sources, looking at the web of connections (cultural, sociological, ecological, etc.) that bind humans to whales and vice versa. Brought together, they can mobilise interest, engagement, the knowledge and willingness to care and to protect. Laist's book comprehensively portrays the historical 'baggage' and its value as a data source, but also the adventure and practicalities of conserving these enigmatic, iconic whales.

Elaine Charwat FLS

The Botany of Mangroves (Second Edition)

PB Tomlinson

418pp, Cambridge University Press, 2016, hardback.
Mono, halftone and colour illustrations. $84.99
ISBN 978-1-107-08067-6



This book contains up-to-date information considerably extending the value of the popular and widely read first edition (1986) that served as a primer for the study of plants in tropical intertidal forests. Barry Tomlinson is a well-respected world expert in the subject, who has wide experience of mangroves worldwide, in the 'field'. He has drawn on the work of many with related current research interests, particularly with respect to the socio-economic impact brought about by destruction of a very high proportion of mangrove habitats.

The Botany of Mangroves will be of principal interest to those with academic and applied interests in the biological, morphological, ecological, socio-economic and environmental importance of mangrove plants, and those concerned with the taxonomy of mangrove species. The book is about mangroves and not mangal, and helpfully defines these terms.

The profusely illustrated text and easy style of presentation will also attract a wider readership that would benefit from dipping into selected chapters.

The main chapters in Part I cover ecology, floristics, biogeography, shoot and leaf systems, structural biology, root systems, water relations and salt balance, flowering, seedlings and seeds and mangroves and people. Part II gives detailed descriptions of plant families found in the mangrove itself and using current taxonomy. There is a very comprehensive set of references.

This is a timely work the conclusions of which are of key importance when exploitation and destruction of mangroves is having serious environmental consequences, and threatening the livelihood of millions who have traditionally coexisted with mangroves.

DF Cutler PPLS

Painting by numbers: The Life and Work of Ferdinand Bauer

David J Mabberley

272pp, Sydney: NewSouth Books, 2017, hardback.
Colour illustrations. £49.95
ISBN 978-1-742-23522-6

This beautifully produced, but heavyweight and somewhat difficult to handle, volume contains synthesis of available information on the life and work of the incomparable Austrian artist, Ferdinand Bauer, together with many reproductions of both his original field sketches and the finished watercolours. Many of these are published for the first time and are of particular interest in showing Bauer's unique technique of colour coding his field drawings, sometimes shown with the watercolour and corresponding herbarium specimen, on adjacent pages, making Bauer's skills immediately evident.

The author, together with Professor H Walter Lack, has already published extensively on the Bauer brothers, the *Flora Graeca* and the early exploration of Australasia, with at least two dozen publications listed in the bibliography, but the large format of this work, and the inclusion of groups of related illustrations make it a unique resource.

Despite the lack of substantial biographical information on Ferdinand Bauer, this gives a comprehensive overview from birth to death, and uses contemporary resources to throw some light on his personality, as well as the ways in which his legacy is only now being revealed, including the breaking his 'colour code' system and information gathered from access to the rich archival holdings held in Vienna.

Apart from the straightforward biographical account, this book also covers much that is of interest in the history of exploration, natural history and art history. It may also help in revealing new resources linked to Ferdinand Bauer: there is currently no known portrait of him and there is a strong likelihood of there being unattributed flower or other paintings waiting to be identified as his.

The colour reproduction appears to be excellent, with heavyweight cream paper for the main text, and grey pages marking chapters. Apart from a wealth of plant images, it also includes some of Bauer's little know zoological drawings, with the end papers featuring his colour images of fish and birds. An Appendix gives information on geographical localities, plants and animals commemorating Bauer and comprehensive Notes occupy five pages at the back, followed by a four page Bibliography and Acknowledgements, with the latter giving some history on the gestation of this work. The only thing lacking is a timeline which would help in locating Ferdinand Bauer during his varied travels and career.

Although the large format and heavyweight paper facilitated the publication of high quality colour illustrations, that has made it a relatively expensive book and makes it a cumbersome object to read, but well worth the effort and the price!

Gina Douglas FLS *honoris causa*

Florida Manatees
Biology, Behaviour and Conservation

John E Reynolds III

160pp, Baltimore: Johns Hopkins University Press, 2017, hardback.
Colour illustrations. £29.50
ISBN 978-1-421-42191-9

The Florida Manatee (*Trichechus manatas latirostris*) is the largest manatee subspecies. It occupies an awkward situation of being endangered but living in an environment that is probably at or near its carrying capacity. The threats almost all come from human activity. People (inadvertently) kill or injure them in their boats and build their new homes on the edges of the brackish water where the manatees

live and feed*. The animals are also susceptible to the effects of dinoflagellate blooms (red tides) and the effects of cold weather snaps. Their water is subject to pollution and eutrophication. Despite the subspecies (currently numbering 6,500 or so) being more numerous now than at any time in the recent past it is not safe. Two cold snaps together caused 700 deaths between 2012 and 2014. A further 400 animals were claimed by an unexplained cause in 2015. Moreover, the human population of Florida is increasing together with the threats they pose to the manatees' environment.

The author is an active marine mammal biologist and conservationist who writes well. The early chapters deal with the natural history and biology and they are well put together. Perhaps not many readers will know that manatees' teeth wear down and fall out because the sea-grasses they eat are mixed with silt. Like elephants, they replace them with new ones erupting at the back of the jaw and migrating forwards. However the major element of this book is the thoughtful review of how conservation efforts will have to be organised if they are to work. Reynolds is a former chair of the US Marine Mammal Commission and Senior Scientist on the Mote Marine Laboratory Manatee Research Program, so his views are well worth reading. They actually apply to all our conservation efforts. For example, given that the US and other governments have to primarily fund efforts to combat terrorism, maintain the economy and try to preserve jobs, "…will benign neglect and a consequent lack of funding for our environment and the living resources it contains, be their downfall?"

The book is copiously illustrated with absolutely splendid pictures by Wayne Lynch and I strongly recommend reading it both for the biology of an interesting species as well as the author's excellent discussion of the arguments about conservation.

Brian Livingstone FRCS FLS

*Human activity is not all negative. The fossil fuel power stations around the Florida coast emit warm water and this can provide refuge for hundreds of the manatees in the cold spells that can affect them in this Northern part of their range.

The Malay Archipelago: The Land of the Orang-Utan and the Bird of Paradise

Alfred Russell Wallace
(Introduced by George Beccaloni; preface by Steve Jones)

2 vols. (392pp & 352pp), London: The Folio Society, 2017, hardback/slip case.
Colour illustrations. £99.00

It would be pretentious to review this title as if it had just appeared. No reader could approach it in the same way as when first published in 1869: Wallace's

ideas have been incorporated into biogeography, and his general involvement with theories of natural selection is well known. The first edition received enthusiastic reviews in a wide range of periodicals, some of which are discussed and quoted in the title's Wikipedia page. It was also widely reviewed in newspapers, with the *Pall Mall Gazette* describing Wallace as an "enthusiastic naturalist … when a man can sincerely congratulate himself on the discovery of a 'superb bug' in his sleeping compartment his enthusiasm can no longer be called into question" (21 April 1869, p 13); the *Morning Post* pointed out the significance of the differences between the fauna of Bali and the western archipelago and Lombok and the eastern islands (31 March 1869, p 31). On the other side of the world, *The Australasian* (Melbourne), identified him as "known to science as a collaborateur of Mr Darwin", and welcomed his book as breaking through the "jealous and exclusive policy of the Dutch" that had kept the islands "a sealed book to science". The reviewer concluded "he has given us a work which is unquestionably the best which has appeared in [English] on the condition of a group of islands destined to be of great interest to Australia in the future" (5 June 1869, p 712).

Reading it again I remain impressed by how, by departing from a strict chronology, (which is given in Beccaloni's added itinerary) Wallace skilfully constructs a connected narrative of localities, and at the same time explains patterns of natural history and anthropology he observed. It is no surprise that it was so well received on publication, nor of its endurance. Indeed, it has endured so well that there are numerous editions in print in hard copy and in electronic form, too many for a meaningful comparison in the space available.

How well does this edition represent Wallace's first edition, the source upon which the Folio version is based? It is a very good, comfortable, two volume reading text, without intrusive modern interpretative apparatus. It is not a facsimile, nor does it include Wallace's Appendix 'On the crania and languages of the races of Man in the Malay archipelago'. The modern minimal index is almost hopeless for retrieving information: 'Lombok', for example, is followed by 17 page or range references here, whereas in the original it is "Lombok, island of i 3; ii 85; no forest in, i 8; resemblance to Australia, 13 (*see* Bali and Birds), 152; … punishment of theft and adultery, 173, 174; jealousy, *ib*. (*see* Trade)". But it adds 64 pages of delightful colour plates relevant to the text, including a few that had illustrated technical papers by Wallace, as well as the black and white engravings from the original; slightly confusingly there are also new B&W images, which are not always immediately identifiable as new. Somewhat anomalously, given that Wallace "never mentions his role in the discovery of natural selection" (Beccaloni, Introduction, p xxxvii), the edition includes Wallace's 'Ternate paper' read, with Darwin texts on Natural Selection, at the Linnean Society in 1858. That this Appendix is an addition is asserted unambiguously only on the copyright page.

This edition is the most expensive of those in print; but like most Folio editions, it is likely to hold its value. Indeed, although still in print, on 28 October, 2017, I found a copy already offered at £166 on the second hand market.

AM Lucas FLS

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Deaths Reported to Council in 2017

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Mr Robert David Brown
Dr Jean Byatt
Mr Robert Bayliss
Prof. Winfred Benedict,
Dr Robert Daly,
Dr Peter Digby
Prof. Malcolm Edmunds
Dr William Emboden
Mr John Gallagher
Miss Mary Gregory
Mr Stephen Keynes
Dr Dorothy Knight
Prof. James Moody
Dr Eric Perkins
Mrs Ruth Race
Dr John Wilson
Mr William Sykes (Foreign Member)

The Linnean Society of London : Programme of Events

May 2018–October 2018

2 May
12.30–13.00
Fashioned from Nature: Learning from the Linnean Society of London
Edwina Ehrman, *Victoria & Albert Museum, London*

17 May [A]
18.00–19.00
Six Continents: Five Years: One Big Plant Book
Prof Mark Chase FRS FLS, *Royal Botanic Gardens, Kew,* Prof Mike Fay FLS, *Royal Botanic Gardens, Kew* & Dr Maarten Christenhusz FLS, *Plant Gateway*

24 May
16.00–19.00
Anniversary Meeting
FELLOWS' EVENT: Address by Prof Paul Brakefield PLS, plus medals, awards and prizes

6 June
12.30–13.00
Animal Kingdom: A Natural History in 100 Objects
Jack Ashby FLS, *Grant Museum of Zoology, UCL*

21 June [A]
18.00–19.00
The Future of Tropical Agriculture
Dr Edgar Turner, *University Museum of Zoology, Cambridge*

5 July
16.00–19.00
Conversazione: Unveiling 'Herbie'
FELLOWS' EVENT: Taking place at the Linnean Society of London
Presentation by Curator of Artefacts Glenn Benson FLS

27 July
18.00–21.00
Courtyard Late: Resources
A special joint event between the Courtyard Societies at Burlington House

5 Sept
12.30–13.00
Unnatural Selection
Katrina Von Grouw, *Popular science author and illustrator*

14 Sept
TBC
Taxonomic and Systematics Plenary
DAY MEETING

20 Sept [A]
18.00–19.00
How Social Evolution Generates Biodiversity
Prof Rebecca Kilner, *University of Cambridge*

28 Sept
TBC
CEE Autumn Symposium
DAY MEETING

3 Oct
12.30–13.00
The Weird and Wonderful World of Mosses
Prof Jeff Duckett FLS, *Queen Mary Unversity of London*
Followed by a field trip to Hampstead Heath

REGISTRATION REQUIRED FOR ALL EVENTS UNLESS STATED • * 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.

To register and for other events visit **www.linnean.org/events**