



The Linnean



Carl Linnaeus
1707-1778

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THE LINNEAN SOCIETY OF LONDON

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Editorial

This September issue of *The Linnean* includes three articles: two botanical and one zoological. The first botanical article is, in essence, an account of the production by Linnaeus of his *Materia Medica*. In so doing, the author deals with Linnaeus' *Systemma Naturae*, including mineral resources and the branching hierarchy of genus and species. He also describes how Linnaeus produced *Genera Morborum* in which he distinguished one disease from another, then, in his *Clavis Medicinae Duplex* (1776) he classified drugs on the basis of their action on the cortex or the medulla. As the author remarks, by focussing on Linnaeus' nosological work he hopes to have shown its limits and to have shed fresh light on his aims and methods.

The second botanical article describes the discovery of a manuscript listing tulip names and early experimental evidence of hybridisation. It then highlights the growth of tulipmania! There is a list of some 45 tulip names, followed by a description of the early experiments in hybridisation by cross-pollination and the role of pollen in the creation of new plants. Finally it deals with the origin of wood tulipmania.

The zoological article concerns eels, particularly the European eel *Anguilla anguilla*, and the North American eel *Anguilla rostrata*. It records how both species breed in the Sargasso Sea and how their leptocephalus larvae migrate (swim) across the Atlantic either to Europe, a journey of a year or more (covering more than 3500 miles), or in the opposite direction to America, which takes a few months. It then deals with the transition of the larvae into 'Glass Eels' and finally elvers which move upstream (and can even move through damp grassland) eventually changing colour to become first brown and then silver eels. These adult eels can live for up to 40 years and eventually return to the Sargasso Sea when they spawn and die.

At the back of this issue are the Minutes of the 223rd Anniversary Meeting of the Society which took place on Linnaeus' birthday, 24th May.

BRIAN GARDINER

Editor

Society News

The steady flow of projects being undertaken in any scientific institution is often a good reflection of how proactive it is in its chosen field. This is certainly true for the Linnean Society but it is also an indicator of how the various funding streams are holding up and what external grants have been obtained. As I write, one of the Society's longer running projects is reaching completion. In May 2007 we looked at how feasible it would be to create what was to be called the **Legacy Journal Project**. With our publishing partners, Wiley-Blackwell, we agreed that we could make available all the Society's Journals from the very beginning, starting with the Transactions that were first published in 1791. A complete set of everything, well over 500 volumes, was despatched to India in November 2007. The more than 40,000 pages were digitised

and the data is mounted on the Wiley Online Library website. In 2010 Andrea Deneau was appointed by Wiley-Blackwell to work in the Society's Rooms to ensure all the titles of the papers, illustrations and many other details were correct so that everyone searching for a specific article was able to find it rapidly. Andrea will complete this task in September. This massive corpus of work represents a significant resource to researchers and showcases the continuity of the Society's publication of the scientific record within Natural History. Of course Fellows who take their Journals in electronic form will be able to access this database at no extra cost.

Andrea is moving on to work for the Society on its next major project, kindly funded by the Andrew W Mellon Foundation. The project comes in two parts, the first is to digitise the Wallace Notebooks held by the Society which have just been conserved. The images will then be put up on the Society's website so that they can be made freely available to all and in plenty of time for the Alfred Russel Wallace Centenary celebrations in 2013. The second phase is the digitisation of all Linnaeus's own annotated copies of his major works. This will produce a complete reference library for those needing access to his works, a 'one stop shop' one might say, with both the specimens and the correspondence the Society holds also readily available from the website. It will also provide, publically for the first time, Linnaeus's thoughts, additions and deletions as recorded in his own working copies. Hopefully this will provide an exciting and new opportunity to understand his developing ideas on his existing and newly added species contained on all the pages of his works.

Talking of Wallace earlier, reminds me that on November 2nd this year Sir David Attenborough will be speaking, at the Society's Joint Meeting with the Royal Society of Medicine, on **Alfred Russel Wallace and the Birds of Paradise**. As you might expect this will be an all ticket affair so 'book early' as the saying goes!

There is a much nearer Anniversary to be celebrated this year, that of Sir Joseph Dalton Hooker on December 2nd. The Founder's Day Lecture will be given by Jim Endersby entitled, **Smashing species: Joseph Hooker and Victorian Science**. This launches the celebration of this great Botanist and Administrator. It is interesting to note that Sir Joseph's wife presented the Society with all his medals and awards on his death and so a selection will be on show during the celebration period.

On December 9th there is to be a day meeting to be held jointly with the Royal Botanic Gardens, Kew, at Kew, entitled **Sir Joseph Dalton Hooker – A centenary Celebration**. Do look at the Society's website for this day's detailed programme, as well as all the other exciting lectures and meetings that are coming up.

That reminds me of the fact that the Society has been having difficulties with various attacks on its website particularly if you try to Google in via writing in 'Linnean Society'. Whilst the Society is having a more robust and upgraded website created it is recommended that you type *www.linnean.org* into your internet browser to get to the home page easily.

GREN LUCAS
Treasurer

The annual field weekend: this year in Somerset, led by Pat Morris

On a damp Friday afternoon in June, an enthusiastic group of us met at Andrew Sheppy's farm in Congresbury. Undaunted by the weather, we traipsed across Andrew's fields making the acquaintance of handsome and noisy chickens and ornate pheasants, inquisitive Dexter cattle and shy Soay and Hebridean sheep. Andrew specialises in these rare breeds and is passionate in his efforts to maintain them. We were caught up in Andrew's detailed descriptions of the intricacies involved in looking after them and forgot how wet we were, so we were more than ready for tea in the farm barn, prepared by Andrew's colleague, Alex. Her ginger cake was mouth-wateringly delicious! Thus set up we were ready for a visit to the local nature reserve run by the Cobthorn Trust. We learned about the different species of grasses and meadow flowers that thrive there and the appropriate levels of grazing to facilitate the breeding of voles, thereby providing a food source and suitable habitat for barn owls. The rain, though light, was steady and a wet, bedraggled bunch eventually parted company, some to locate their night's lodgings and dry off and others to steam nicely over supper and a pint in a local pub.



Andrew Sheppy talking to the group with one of his nice Dexter 'Ladies' listening in.

On the morrow, mercifully dry if sunless, we reconvened in Cheddar and moved on to a field study site where we met Bob Boyce, one of Pat's network of dormouse monitors. We spent a fascinating morning in woodland on a steep slope helping to place dormice in nest boxes. These dormice were originally collected from the wild the previous year but because of their small body size would not have survived the winter. Bob fed them in captivity to fatten them up to increase their chances of survival.



Bob Boyce holding one of his dormice before putting it into the nestbox where it was found the previous autumn.

He explained how special tags could be inserted under the skin on the back of a dormouse, and how such techniques have enabled researchers to gain information about their life history and habits; for example, longevity, range, and nest-making. Favourite foods of dormice include hazel nuts, blackberries, and the nectar from the flowers of honeysuckle. They like to use bark of honeysuckle to build nests because it is so much more pliable than grass. The importance of the management of woods to encourage dormice by allowing the undergrowth to flourish was also fully explained.

After a picnic luncheon we passed up through Cheddar Gorge, where we saw peregrine falcons, and the pretty, endemic Cheddar pink (*Dianthus gratianopolitanus*)

growing in crevices on the rock face. At Wellington Farm it was fun to meet a herd of alpacas, kept for their wool, who seemed equally pleased to meet us. We then walked across the fields to Black Rock Nature Reserve in the Mendips on the carboniferous limestone at the top of the Gorge, and visited the wood where the original field studies on dormice were conducted under Pat's supervision 25 years ago. We also observed the characteristic badger marks (scratches from their claws) imprinted on the stone walls as they climbed over. This led to an informal discussion, led by Pat, on the pros and cons of a badger cull to reduce the prevalence of TB in cattle in the area. Chris, who runs Wellington Farm, has

The fittest enthusiasts in the group romping up the side of Cheddar Gorge, looking for the Cheddar Pink.





Sara Churchfield and her new friend at Wellington Farm.

badgers living close to his cowsheds but has never (fingers crossed) had TB in his cows.

The day culminated in a sumptuous dinner at Glencot House, near Wookey Hole. A fascinating manor house, filled to overflowing with antique furniture, paintings and prints on every vertical surface and sculptures and ceramics on horizontal ones, Glencot House has a magnificent garden on the banks of the River Axe. In the basement, lesser horseshoe bats provided a diversion and we were able to listen to their characteristic sounds by courtesy of Stephanie West's bat detector which she had conveniently brought with her.



Dinner at Glencot Manor.

Sunday morning heralded a glorious day, with a clear blue sky. We met at the Avalon Marshes Centre on the Somerset Levels, where we were joined by John Mason who helped identify the flora and fauna of the area. We were told about the retreating sea and subsequent colonisation of the drying marshes by reeds, and eventual replacement by sedge and vegetation. As the vegetation decayed peat was formed,



The group on the Somerset Levels discussing peat (above); Anka Mans *et al* and John Mason (ex English Nature) who joined us to assist with invertebrate identifications.

and this led to a discussion on peat extraction, initially for fuel, and more recently for horticulture, and draining of the levels for grazing

animals. The canals which had been dug for drainage were alkaline and provided an excellent habitat for a wide range of invertebrates, including many species of dragon and damselflies. The distinctive sound of marsh frogs was clearly heard, and otter spraint under bridges indicated their existence even though we did not see any. Mary Morris did some pond dipping and soon collected a variety of molluscs, beetles, and shrimps, whilst in the background we could hear the songs of reed and sedge warblers. The subsequent visit to a nearby reed bed proved fascinating, with the sound of male bitterns booming, and the sight of egrets, marsh harriers, teal and gadwall. Finally a short walk along an acidic drainage ditch provided a marked contrast in vegetation to the earlier alkaline ditches at the Avalon Marshes Centre.

And so a splendid weekend finally came to a close, and the tired but happy participants set off in all directions towards home. Sincere thanks go to Pat and Mary Morris for devising such a fine and varied programme and to all their friends who contributed so much of their time and expertise in making the weekend memorable. I am sure that I am speaking for everyone when I say how much we enjoyed ourselves, and how much we learned about this beautiful area of England.

VAUGHAN SOUTHGATE
President

Library

As Fellows will be aware, from seeing the lists of donations to the Library that appear in each issue of this journal, the Society is extremely fortunate in the gifts it receives for the collections. It is unusual to highlight one of these donations above the others, since all are extremely valuable to us, but a really exceptional gift was received in May. Through the good offices of Dr Jonathan Singer, a copy of the Abbeville Press double-elephant folio facsimile of Audubon's *The birds of America* was received from the director of the press, Bob Abrams. John James Audubon became a Fellow of the Linnean Society in 1828 during the time he spent in London enlisting subscribers for this great work. It seems that he even displayed some of his paintings at a meeting of the Society earlier in that same year. The Society's connection with the artist makes the acquisition of this magnificent four-volume work even more special. If any Fellows would like to see the volumes they are available to be viewed in the Library at any time (table-space permitting!).

The centenary of Alfred Russel Wallace will be celebrated in 2013, so there has been a recent surge of interest in our Wallace material from people conducting their research for the publications, films or TV documentaries that they hope will appear in the anniversary year. The Society holds Wallace's manuscript journals and notebooks which were written during his collecting trips to south-east Asia, as well as his later North American travel journal. As reported elsewhere, these will be scanned in the near future and made freely available online.

Over the past few months individual and group visits have been organised for people from a wide variety of backgrounds who have an interest in particular parts of the Society's collections. Most come to see the Linnaean Collections, of course, but many have a specific interest in our collection of botanical art or in a particular artist. Groups have come in from the Worshipful Company of Apothecaries, Sparsholt College, South London Botanical Institute, London Parks & Gardens Trust, the Professional Gardeners' Guild and the Directors of German Botanic Gardens. Visiting university groups have included a large contingent of Danish students and two groups from the United States – from the University of Maryland and from Harvard. Individual visitors and smaller groups have come from the Library of the Royal Botanic Garden Edinburgh, the NHM Library, the Library of the Zoological Society of London and, most recently, a tour was given to two botanists from Kodiak, Alaska.

Sadly, the Society's Deputy Librarian, Ben Sherwood, will be leaving at the end of August to move to Harrogate with his family. Ben has been a stalwart of the Library for more than 4 years and has taken care of Library IT as well as providing an excellent service to researchers both in person and via e-mail enquiries. Everyone at the Society will miss him greatly and we all wish him well in tackling his challenging new role as a full-time father. Fortunately, a worthy replacement for Ben has been found in Elaine Charwat, who comes to us from University College Cork where she worked as a Special Collections Librarian. Elaine was able to join the team at the end of June, allowing for an invaluable two-month handover period with Ben. Do seek her out next time you are in the Library and introduce yourself.

LYNDA BROOKS
Librarian

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Correspondence

From: Patrick F James

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Regarding Dr David Jones' letter (March 2011) regarding the tasting of P.T.C. I did of course know of Fisher's elegant experiments separating out the tasting alleles but I was more concerned with the complete inability to taste.

Together with 6-N-propyl – 2-thiounicil; 4-hydroxy – 2-mercaptan – 6-propyl-pyrimidine, and others (all markers for various chromosomes) I have been uncovering an association between the ability to taste (or not taste) these substances and various levels of IQ.

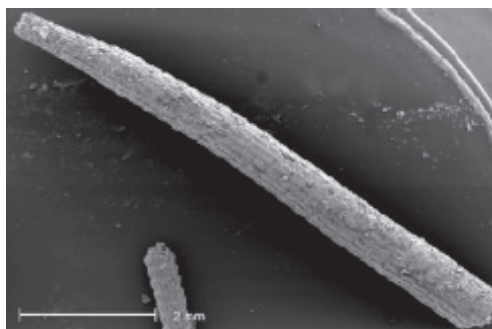
The investigation is ongoing and confined to one extended family (in order to observe the pattern of inheritance. I have only examined about eight hundred so far so hopefully it will continue when I see the brown side of the sod.

From: Stephen K Donovan FLS

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I was fascinated by the scanning electron micrographs of the spines of the cacti *Opuntia* sp. and *Cereus* sp. in the paper by Brown *et al.* (*The Linnean* March 2011 vol 27, No. 1, pp 14-21). Their external morphology is remarkably reminiscent of the radioles of diadematoïd echinoids. The principal difference is that the whorls of small spines on the external surface are directed towards the tip in diadematoïds (Fig. 1), but away from the tip in these cacti. I presume that these act to anchor the spines of cacti after they penetrate flesh, making withdrawal painful. In diadematoïds, the bane of many tropical holidays, the radiole penetrates the flesh, but is easily broken off along a calcite cleavage plane, leaving it embedded. I presume the small spines in this case act as multiple cutting tools during insertion.

Figure 1. Diadematoïd sp. indet., tip of radiole, from the Early Miocene of Gunung Eso, central Java, Indonesia. Collected by W. Renema in 2009. Specimen in collection of Department of Geology, Netherlands Centre for Biodiversity Naturalis.



‘A Catalog of Distempers’ Linnaeus’ ‘Bridge too Far’?

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‘Of course’ said the G.P. ‘We’ll need more tests to rule out pyroclastic hyperplasia, but all the signs and symptoms, particularly the elevated seraphocyte count, indicate that you have Crum-Brown’s Late Onset, Idiopathic Nucleophilia.’ ‘Is it infectious?’ I asked. He turned, momentarily, from his computer screen, gave me a withering look and told me that it was important to differentiate between transmissible and congenital diseases. He sighed, turned back to the computer and said that he would refer me. C-B.L.I.N. was it rare? Was it life-threatening? Would I have my picture in *The Lancet*? The letter came summoning me to attend the local hospital at 2.00 p.m. three months on Wednesday: Dr. Hammick-illingworth’s clinic.

My illusions of uniqueness and fame were shattered immediately. ‘Oh yes’ said the receptionist. ‘The Wednesday Nucleophilia clinic, turn left at cardio-thoracic and keep straight on past oncology and orthopaedics, you can’t miss it’. I found it. The notice read, ‘Late Onsets, waiting area B’. It was full. Everyone had a 2.0 p.m. appointment and Dr. Hammick-illingworth had been delayed.

If that ‘idle vagabond’ (Macgillivray p.195), Karl Linne, better known to the world as Carolus Linnaeus, had had the wit to become a clergyman or be apprenticed to a shoe maker, the above scenario might never have been realised. As it was, since natural history, about which young Karl was passionate, ‘... was not then in Sweden ... a study which of itself could lead to wealth, or even to a moderate independence...’ it was therefore resolved that he should qualify himself for the practice of medicine...’ (Macgillivray p.196). Linnaeus’ parents were persuaded to this course of action by the local physician, one Dr. John Rothman, who was to become the first of Linnaeus’ many patrons. Linnaeus eventually took his M.D. at Harderwijk in 1735 by defending a thesis on intermittent fevers, and, by 1750, this ‘idle Vagabond’ was being hailed as ‘...the greatest Botanist that the world ever did or probably ever will know’ (*Monthly Review* III. p.205).

The connection between Botany and Medicine is, of course, very ancient and can be summed up as *Materia Medica*, a title dating back to Dioscorides, and a subject which was to become part of Linnaeus’ professorial brief when he was appointed to the Chair of Medicine at Uppsala in the Autumn of 1741. *Materia Medica*, at this time, was still based mainly on plants although some spagyrics, such as mercury and antimony along with, those once frowned-upon, ‘specificks’ like cinchona bark, introduced by Thomas Sydenham, were already widely used. ‘Herbals’, of one sort or another, were the standard reference works but these were condemned, by medics, as being mere ‘Synopses’ (*Phil. Bot. Aph.* 153). In no sense were they systematic treatises and the medical profession felt that a proper, i.e. philosophically-based, discipline was needed in order to elevate medical botany above the level of peasant ‘wort cunning’

and the Apothecarial trade. There was, however, heated controversy about the form which that philosophy should take and the key, which Linnaeus was to use, can be traced back to his boyhood education which consisted of the ‘...classics, Hebrew, theology and what passed for Aristotelean philosophy,...’ (Morton p.259). We know that he was presented with a copy of Aristotle’s *Historia Animalium* by his father ‘...who taught him the elements of the Latin language, geography and other departments of knowledge suited to his capacity.’ (Macgillivray p.194). It was, however, his discovery (probably in 1727) of the great French botanist, Joseph Pitton de Tournefort’s, *Institutiones rei herbariae* (the Latin translation of 1700 of the French original, *Elémens de Botanique* of 1694 and illustrated by Claude Aubriet of *Aubrietia* fame), which focused Linnaeus’ attention on the systematic study of plants. In his own *Philosophia Botanica*, of 1751, Linnaeus was to classify Tournefort as a ‘Corollist’ (Aphorism 64) on account of his use of the corolla as the essential character on which his classification of flowering plants was based. In Aph. 21, however, Linnaeus also classifies Tournefort as a ‘Controversalist’: one who disputes published writings. Linnaeus was making reference here to the protracted disputes involving Tournefort (1656-1708), the Englishman, John Ray (1627-1705) and Rivinus of Leipzig (1652-1725) over the number and type of characters which should be used in plant classification (See Sloan). Linnaeus’ own classification, of course, used number, shape, proportion and positional characters of the androecium and gynoecium which famously became known as the ‘Sexual System’ (Aph.93). His attention was probably drawn to the significance of these floral characters by his reading Sebastien Vaillant’s, Latin translation of a lecture entitled *Discours sur la structure des fleurs*, which dealt with the sexual nature of flowers. Both the Latin, *Sermo de Structura Florum*, and the French original were published in 1718.

As we are all aware, Linnaeus’ classification and nomenclatural reform of plants and animals was, for a while, to outstrip all others in its popularity and is celebrated to this day. Initially, however, Linnaeus’ ‘Sexual System’, with its explicit analogies to animal genitalia, was, in his own day, the subject of vitriolic attacks. The physician, Georg Siegesbeck, of St Petersburg, thought it ‘loathsome harlotry’ which would bring the whole science of botany into disrepute. Oxford’s Dillenius advised Linnaeus to re-read his Theophrastus, Sir Hans Sloane thought that an alphabetic classification might serve as well and Georges-Louis Leclerc, Comte de Buffon, given his attachment to the ‘Scala Naturae’ and Leibnitian continuity, rejected out of hand the possibility of *any* sort of classification, especially that of Linnaeus. For Buffon, Nature constituted a seamless continuum, ‘The Great Chain of Being’. The ‘Principle of Plenitude’ allowed no gaps, *Natura non facit saltus*, and, if there were an apparent gap, it simply reflected human ignorance. This was why ‘Zoophytes’ were so important as they clearly represented a ‘passage’ between the Animal and Plant Kingdoms. As a consequence of this continuity, any classification, which was required for practical purposes had, necessarily, to be an ‘artificial’ one and, therefore, ‘unphilosophical’. Buffon did, however, defend his countryman, Tournefort, against Linnaeus’ criticisms and argued for the merits of his retaining the old Theophrastian division of plants into trees and herbs. We may imagine Buffon’s chagrin when Louis XV, in 1774, decreed that the Linnaean system be officially adopted at the Jardin du Roi!



The 'Sexual System' first appeared in Tomus II of Linnaeus' *Systema Naturae*, 1735, Tomus I being devoted to animals. Both these works continue to be celebrated with the same reverence as Copernicus' *Revolutionibus*, Newton's *Principia* and Darwin's *Origin*. Tomus III of the *Systema* is, however, seldom mentioned now in polite circles. This volume deals with the classification of the Third Kingdom of nature, 'Lapides', rocks and minerals and shows that Linnaeus did not need Dillenius' injunction to re-read Theophrastus, he was already quite familiar with it. G.E.R. Lloyd, in his *Greek Science After Aristotle* cites Theophrastus' *On Stones* as being '...in the tradition set by Aristotle in his zoology.' (p. 11). This treatise is regarded by E.R. Caley and J.F.C. Richards as 'for almost two thousand years ...the most rational and systematic attempt at a study of mineral substances'. Given Sweden's dependence, both militarily and commercially, on her mineral resources, it is not surprising that Linnaeus took an interest in mines and mining and, in fact, for a brief period, worked as an 'assayer'. Yet, indirectly, Linnaeus' now forgotten Tomus III was the foundation of modern crystallography since it inspired the work of René-Just Hauy, the French mineralogist.

It is with 'Lapides', in his *Systema Naturae*, (p.6) that Linnaeus begins his account of the 'Naturalia'. This, for him, was the obvious starting place since rocks and minerals are at the lowest level in the ascending order of complexity. Vegetabilia and Animalia follow and each is characterised as follows. Lapides grow (congesta) but are non-living and are not sentient. Vegetabilia are organic bodies which are living but are not sentient. Animalia are organic bodies which are both living and sentient. These definitions he repeats in the introduction of his *Philosophia Botanica* of 1751. It is with Lapides, however, that problems arise. Linnaeus' attempt at mineral classification is dependent on the same *a priori* reasoning as is his 'Sexual System' and this is coupled with a Paracelsian variety of 'geochemistry'. 'His views', says Macgillivray, 'are extremely fanciful ... As they have long ago passed into oblivion, it may afford amusement, if not instruction, to present an outline of them' (p.300). He goes on to say that, 'Had Linnaeus been as unfortunate in his other theories as in this, his name would have been long forgotten' (p. 303). His classification of diseases has suffered a similar fate but it is the *reasons* for the failure of these systems that make Linnaeus' methods worth revisiting. For Linnaeus, his life's work was a single enterprise which cannot be understood by separating it into the modern categories of zoology, botany, mineralogy and medicine or by casting it adrift from its philosophical moorings. Afterall, the three great Kingdoms of Nature were creations of the same Divine hand and were, consequently, amenable to the same methods of analysis. Indeed, in Aph.147, Linnaeus quotes 'the Ancients' with approval for their image of a plant as 'an animal turned upside down'.

Stephen J. Gould was the last to comment on Linnaeus' classification of minerals and diseases but, while he dismisses both, he makes the incisive comment that,

'The strength of any great system shines most brightly in the light of limits that give sharp and clear definition to the large domain of its non-universal action!' S.J. Gould p.300.

Gould's observation prompts the question as to why Linnaeus' methods work, more or less, with living organisms but exceed their limits with rocks and diseases? Ironically the clue lies not with Linnaeus but with Jean-Baptiste Lamarck (1744-1829),

a student of Buffon who, among his other multifarious activities, attempted an unsuccessful classification of clouds (nephology) using, as a basis, his master's Leibnizian continuity. His classification was unsuccessful because clouds, in common with rocks and diseases, are not 'analysed entities' (see Cain, 1958). Neither, for that matter, are plants and animals but, as we shall see, there is a crucial difference which is highlighted by a study of Linnaeus' nosology.

According to A.L. Peck (1965, p.vii), the method of classification, used by Linnaeus and known as 'Diairesis' or 'Logical Division', was inherited from Aristotle, '...through the Stoics, Porphyry and the Greek commentators' (A.L. Peck p. viii). It originated, however, with Aristotle's mentor, Plato, whose interests lay with analysed entities i.e. those entities about which *a priori* statements were possible. The classical examples of these are geometric figures such as the triangle, whose essential properties may be defined, both exclusively and exhaustively as a plane, three-sided figure, the sum of whose internal angles is 180 degrees. This definition fully defines the genus (*genos*) or essence while differentiae, based on the ratios of their sides, define the species, or *eidos*, as scalene, equilateral and isocles. Such characters as colour are per *accidens* and play no part in this essentiality.

Defining the essence of a geometrical figure is one thing, framing such a definition for living organisms, rocks, clouds and diseases is quite another and it was Aristotle himself who first attempted to modify Logical Division so that it could be used as an analytical tool for the understanding of the living world. The difficulty was, as Phillip Sloan christens it, 'Aristotle's problem', that '... seeming impossibility of determining the assumed essential characters in organisms in a way which permitted the subordination of characters as required by the method of division and the canons of traditional logic' (Sloan p.9). If, as Buffon believed, organisms were created and arranged in a *Scala Naturae* without discontinuities, then only individuals had any real existence while higher taxa were simply useful fictions, created '...only for the solace of our mind;...' (Gilson p. 40). The second difficulty was the 'Problem of the Universal'. Since, because Logical Division could not accommodate individuals, species were the ultimate (Infima) twiglets of the dichotomously branching hierarchy. This position gave them a spurious 'fixity' because, in order to be both exclusive and exhaustive, the method was based on the 'Law of the Excluded Middle' which relied on the existence of those very discontinuities strictly disallowed by the *Scala Naturae*. Aristotle was fully aware that Logical Division, when applied to living organisms, was wanting in a number of respects to which he famously drew attention in his critiques in both *De Partibus Animalium* and *Historia Animalium*. Indeed, Aristotle, as Plato's pupil, was the first to begin to write those Whiteheadian 'footnotes'. Among his many objections was adherence to strict dichotomies which were the inevitable result of using a single character, *Fundamentum Divisionis*. He also criticised the use of, what he called, 'privative' differentiae, such as 'footed', as opposed to 'footless', arguing, quite correctly, that this latter category could not be further divided. Linnaeus faced both these difficulties with the Cryptogams which, by definition or 'privative' division, possessed no fructification which was, for Linnaeus, the *Fundamentum Divisionis*. In fact the whole 'Sexual System' can be arranged in the form of a branching tree with four branching Weibelian orders. The Phanerogam/Cryptogam division is now no

more but Aristotle's privative 'Blooded/Bloodless', translated into verts. and inverts by Lamarck, is, despite Cuvier, still with us! How were these shortcomings to be overcome and the *Scala Naturae* arborised?

There were three ways to circumvent, if not to solve, these difficulties. The first, used by Aristotle himself, remained overwhelmingly influential down to the time of Linnaeus. It was argued that the so called 'essential' characters of an object could be recognised by an intuitive resonance between the observer and the observed, the 'Hyalomorphic' Doctrine. In this way Andreas Cesalpino, in his *Libri de Plantis*, of 1583, was able to justify the 'naturalness' of his division of plants into woody and herbaceous, a division which, as we have seen, Tournefort maintained over a century later. For Cesalpino, along with many others, the most important function of all living organisms was, *a priori*, considered to be that of nutrition and, in plants, this was subserved by the stem. Hence the structure of the stem was that *Fundamentum Divisionis* by which the Plant Kingdom must be initially divided. The second approach was to recast living organisms as 'analysed entities' and there was no shortage of attempts to do this. Descartes seems to have initiated the process with his battle cry of 'Matter in Motion' and managed, using the 'mathematics' of digestive physiology, to elucidate the mechanism of the 'Transubstantiation'. His efforts were followed by a variety of Newtonian iatromechanics, who attempted to explain living organisms as hydraulic/pneumatic machines from which it followed that their diseases could be interpreted as disruptions in the flow of fluids. One of the most influential of iatromechanics was Giorgio Baglivi (1668-1707) who held that the human body '...operated by number, weight and measure' and that its proportions were determined '...by the pen of mathematics alone'. Two centuries later the Transcendental Anatomists looked to Plato for their inspiration when producing abstract, geometric archetypes. This geometrisation lived on through the work of Henri de Blainville, with his division of the Metazoa into 'Actinomorpha' and 'Zygomorpha'. Haeckel and Hatschek followed, the latter being responsible for the introduction of the Radiata and the Bilateria (188-1891) as the primary Metazoan dichotomy. D'Arcy Thompson's *Method of Transformations* (1917) drew both on his reading of Aristotle's doctrine of 'excess and defect' (H.A. 1.1 486b. 15. et seq.) and also depended on the use of Cartesian coordinates to mathematise the very concept of species. This geometrisation continues, although the geometry is no longer that of Euclid but of Mandelbrot and it is the generative algorithm rather than a descriptive equation which has become the *fundamentum divisionis*. Even speciation itself has acquired a new mathematical interpretation based on 'symmetry breaking', represented by a series of cascading bifurcations which Aristotle would have recognised immediately. These techniques sidelined rather than answered the question of why Logical Division, albeit the Aristotelian modification thereof, was stretched to its limits by living organisms and broke down entirely when applied to clouds, minerals and diseases.

Classification is used as both a verb and as a noun, i.e. process and product, method and system, and both Aristotle and Linnaeus were fully aware of this double usage. We, however, with our focus on the computer-generated finished products, have allowed our interest in process to lapse, or, at least, left it to those who write the computer software! The third route around 'Aristotle's Problem' and to that of 'Universals' is to attempt to recapture this *process* of classification and examine Linnaeus' approach thereto.

D.M. Balme (p.184) sums up Aristotle's attitude to classification when he says 'For him therefore classification is not only a logical structure but must be to some extent explanatory, ... genus is a category of substance, while differentiae are qualities'. Even a cursory glance at Linnaeus' *Philosophia Botanica* confirms his debt to the Master! Linnaeus devoted no fewer than 25 of his Aphorisms (282-305), under the Section on Definitions, to laying down the law on how differentiae are to be constructed. Included in this group, is the famous Aph.286 which states that 'A specific name without a generic one is like a bell without a clapper'. What he meant by this was that any definition lower in the branching hierarchy *must* refer to, and qualify that of the taxon immediately above it, *per genus et differentiam*. For Linnaeus, however, the genus was all, species were merely variations on the generic theme. This all-important difference is reflected in the genus always being written as a substantive while the species is adjectival. Linnaeus summed up his position in Aph.169: '...a character does not make a genus, but the genus makes the character'. Aristotle used the terms *genos* and *eidos* for all levels of differentiation but, by Linnaeus' day, *genos* had become *genus* and *eidos*, *species* and they referred, respectively, only to the penultimate and ultimate twiglets of the tree. We have retained this usage and it often contributes to our misinterpretation of those past writers who used the terms in a more strictly Aristotelian sense. Although Linnaeus uses the terms genus and species in our sense, we must remember that, in his System, his 'Ariadne's thread of Botany' (Aph.156), his levels of differentiation are as follows: Summum genus, corresponded to class, genus intermedium to order, proximum genus to genus and infima species to species. For Linnaeus, the very foundation of Botany was the establishment of classes, orders and genera (Aph.152) preferably arranged in a 'Natural System' wherein '...All plants exhibit their contiguities on either side, like territories on a geographical map' and is the '...beginning and the end of what is needed in botany' (Aph. 77). It was, in short, to reveal the place in Creation of every organism and this fundamental understanding was to be encapsulated in the name. The fact that even Linnaeus' 'Artificial System', although it contains many glaring inconsistencies such as *Viola* in Class XIX, Syngesia, which otherwise corresponds very well with the Asteraceae, and seeing the Pentandria (Class V) embracing both Apiaceae and Amaranths is something of a shock, Linnaeus' system is closer than we have any right to expect to broad angiosperm groupings if not to the phylogenetic relationships as revealed by the APG system. This is not remotely the case with either minerals or diseases. It is, of course, Charles Darwin who gives us the reason for this, 'that community of descent is the hidden bond which naturalists have been unconsciously seeking,...' (Darwin p.404). Aristotle, Linnaeus and all the others who used one or other modification of Logical Division '...succeeded', as S.J. Gould put it (Gould p.300), 'precisely because [they] had constructed a logic that correctly followed the cause of order in the organic world'. In short, branching hierarchies mirror the mechanism of evolution itself. Linnaeus' system, to quote Gould again, survived '...intact in sailing right through the greatest theoretical transformation in the history of biology' (Gould p.300). It also explains that crucial difference between the living and the non-living. While accounting on the one hand for taxonomy's partial success, it also accounts for the failure of attempts to reduce living organisms to 'analysed entities'. With minerals, clouds and diseases, however, there can be no pretence at all that Logical Division could produce any sort of classification which

reflected generative mechanisms. In any case, even classifications of living organisms whether they be monothetic, *à la* Tournefort, or polythetic, *à la* Ray, based, as, until recently, they had to be, on phenotypic characters, were merely the shadows on that Platonic cave wall. This crucial difference was, of course, unknown to Linnaeus and his contemporaries and the question which *they* addressed was that of causation and it is, indeed, the one with which we see Linnaeus wrestling in his nosology.

‘It is necessary’ wrote Thomas Sydenham, ‘that all diseases be reduced to definite and certain species, and that, with the same care which we see exhibited by botanists in their phytologies...’ (1676). Thomas Sydenham (1624-1689), that advocate of cinchona bark as a cure for intermittant fevers, was one of Britain’s leading physicians and friend of the Physician and Philosopher, John Locke. Both had studied medicine in Montpellier at the time when the illustrious Pierre Magnol, Tournefort’s mentor, was Professor of Botany there. Sydenham’s works were widely read on the continent and were certainly held in great esteem by that iatromechanist, Giorgio Baglivi who, in his own *de Praxis Medica* (1699) reiterated and elaborated Sydenham’s call for a classification of disease. One reader was François Boissier Sauvages de Lacroix (1706-1767), a Montpellier physician himself and another disciple of Sydenham. He took up Sydenham’s and Baglivi’s challenge and, in his hands, Sydenham’s suggestion to reduce diseases ‘...to definite and certain species, ...’ was transformed into a call for a hierarchical classification. In 1731 Sauvages, encouraged by Hermann Boerhaave of Leyden, published his *Nouvelles Classes des Maladies qui dans un ordre semblable a celui des Botanistes, comprennent les genres et les especes de toutes les Maladies, avec leurs signes et leurs indications*. He subsequently sent a copy to Boerhaave for his approval. It seems that, when he was in Leyden (1735-38), Linnaeus saw this work and began his own researches on the same subject as evidenced by the entries in his hand-written *Vademecum*. He wrote to Sauvages requesting a copy of his *Nouvelles Classes* and Sauvages complied on July 10th 1737. So began a life-long correspondence between the two and Nosology was born.

Nomenclature of disease, at this time, was in the same state of chaos as was botany in its ‘herbal’ era, a non-systematic mish-mash which the Scottish physician, John Drummond, condemned as a ‘catalog of distempers’ (Drummond 1733, p.262) and called for diseases to be reduced ‘...to the same class or general head’. What, however, were the criteria to be used to meet these demands? Sauvage, following Locke and Sydenham, dismissed the use of ‘cause’ as a useful criterion. For these two ‘skeptical Physicians’ man could only know the ‘outer husk of things’ and to attempt to delve into the ‘abyss of cause’ was futile and a waste of valuable time. As for hypotheses from which to deduce, *a priori*, assumptions, Locke, Sydenham and Sauvage had no time at all. For them, only good, empirical observation could yield anything of value. Nevertheless it probably was possible to distinguish ‘species’ of disease based on symptomatology alone. Sauvage agreed. Linnaeus took a more catholic approach and, on the title page of his nineteen-page pamphlet, *Genera Morborum*, (1737/38), appear the words ‘*a causa vel signis*’ which clearly indicate that, at least, under certain circumstances, he believed that causes *could* be used in the creation of disease taxa. He goes on to advise that the beginner, however, should be content with symptoms and to warn against the practice of those who ‘...confused causes with symptoms in the diagnosis of diseases and wasted their efforts’.

Whatever criterion was seen as the *Fundamentum Divisionis* of disease, the fraught question was, did disease species exist at all? Were they even entities, let alone analysed ones? The Jury was Out on these issues. Even Locke had some doubts about Sydenham's belief in separate species. The humoral pathology of Galen and the doctrines of the Iatromechanists and chemists presented a unitary picture of disease, analogous, in many ways, to a *Scala Naturae*, in which diseases could not be differentiated into genera and species, – *natura non facit saltus* again, – but were simply different manifestations of a continuously varying 'force' – Sometimes referred to as 'Asclepiadean Methodism', this doctrine was often carried to ridiculous lengths and, in 1802, even caused a riot at the University of Gottingen! It did, however, have its uses in that it lent itself to idiopathic medical practice, that is to say patients could be treated as individuals whose maladies were peculiar, if not unique, to themselves. This had enormous economic consequences for the medical profession, which operated, at this point, in 'bedside', as distinct from 'hospital' mode. In short, there was cash in idiopathies and in keeping secrets but times were changing and universally agreed nosologies had to come. Linnaeus was to be at the forefront of this Medical Reformation.

In 1759 Linnaeus, now long established as Prof. of medicine at Uppsala, produced a version of his *Genera Morborum* as a dissertation to be defended by one of his students, Johann Schröder. To this he attached a short proemium in which he clearly sets out his methods and purposes. He begins by saying that the first aim of medicine is to cure disease and the first step to that end must be to distinguish correctly one disease from another as recommended by Sydenham and others, and this can be done by using causes, effects and signs. After the genera and species of disease have been categorised and named, then, and only then, can a systematic classification be produced. Linnaeus sees such a classification as that constantly recurring symbol, Ariadne's thread, to guide the beginner:

'ut habeant Studiosi Medicinae hoc quasi filum ariadnaeum, quod in posterum sequantur'

At the conclusion of the proem., he emphasises his version of 'Ockham's Razor' by saying that the number of symptoms used as differentiae must be as few as possible and '...nothing over and above what is necessary' (ne superflua immiscerentur necessariis). The proem. is followed by the 'Clavis Classium' in which Linnaeus initially recognises nine 'classes' of disease whose relationships can be rendered as a branching tree. However, because diseases are not analysed entities and whose generative mechanism cannot be reflected by a dichotomously branching hierarchy, Linnaeus has no compunction about bending the rules of Logical Division in that he uses 'privative' divisions and resorts, when necessary, to using trichotomies. Indeed, even his 'Sexual System' for plants, when arborised, shows that the terminal branches are often polychotomous. Tucked away at the bottom of this Clavis is a short but fascinating sentence:

'SYMPTOMATA se habent ad Morbum, ut Folia et Fulcra ad Plantam'

('Symptoms are to disease as leaves and fulcra are to plants')

Here is Linnaeus' *cri de coeur* and it reveals his true aspirations.

Animals, plants, rocks and minerals are all events in time and space but, as extended

transients, they are also material entities which can be collected and stored for further reference. Those eighteenth century ‘Cabinets of Curiosities’ bore testimony to this fact. Even fugitive clouds, although they could not be preserved, could, nevertheless, be recorded in the form of paintings. Diseases, on the other hand, while they were undoubtedly events in space and time and while they left their pathological signatures as lesions and deformations of tissues and organs, to be revealed *post mortem*, as Giovanni Battista Morgagni proved in his monumental *De Sedibus et causis Morborum* (1761), they were *not* material entities but an ephemeral series of symptomata. Their saving grace, from a taxonomic standpoint, as Sauvages emphasised, was the fact that these symptoms were, for a given disease, usually ‘Manifest, Essential and Constant’. So classification *was* possible but, to return to Linnaeus’ telling caveat, symptoms, while being very far from ideal for the purpose, were all they had to work with. For Linnaeus, the fructification of a plant was the *Fundamentum Divisionis* but, for disease, only knowledge of the cause could be used to produce a ‘natural’ classification and this was, for the most part, completely unknown or, as Sydenham put it, we can only know the ‘outer husk’ of things, the ‘superficies of bodies’; of that ‘abyss of cause’ we will forever be ignorant. Linnaeus and his contemporary nosologists had, then, to fall back on ‘vegetative’ characters, ‘Symptomata’ or those ‘Folia et Fulcra’. Fulcra is a category precisely defined by Linnaeus, in Aph. 84 (Phil. Bot.), as, ‘accessories to sustain the plant more aptly... The stipule, the bract, the spine, the prickle, the tendril, the gland, and the hair.’ and were only used, along with the leaves, folia, in botanical systems to differentiate species within a genus. In nosologies, however, with no real scope for subordinating characters and no access to that ‘Abyss of cause’, ‘Symptomata’ had to serve throughout the hierarchy. In spite of these shortcomings, Linnaeus was still able, cleverly, to apply certain basic principles. For him, the genus, in all three Kingdoms and in disease, was a ‘natural’ taxon i.e. its definition had to be explanatory of its essential nature and, therefore, not use *per accidens* Aristotelian characters. It had, therefore, to be constructed by induction, i.e. by the collecting together and distilling out the communalities of all the constituent species just as Aristotle had taught. Suprageneric taxa, however, were different. They *could* be established by deduction, i.e. *a priori* and Linnaeus enjoyed himself by doing just that.

Linnaeus sets out his method for creating these higher taxa in a one page appendix to his *Genera Morborum*. Borrowing the cortex-medulla model of the animal body from Cesalpino, Linnaeus sees the body as composed of solids and fluids with the brain, spinal cord and spinal nerves as the medulla-cerebroso or pith. The woody cortex of the plant was analogous to the vertebral column, the ribs being the boughs. Attached to these were the ‘leaves’, i.e. the muscles. All these elements were a prey to disease processes which resulted in manifest symptoms and, in some cases, suprageneric taxa could be based on these morphological analogies. All this was embodied in the *Clavis Classium* and also in Linnaeus’ most extraordinary work, *Clavis Medicinae Duplex* (1766), which he considered to be his greatest, in which he classifies all drugs as to whether their action is on the cortex or the medulla. Here he brings together both the taxonomy of diseases themselves and their ‘natural’ therapies.

The ordinal levels of his nosology were reached in various ways with regional classifications being used as far as possible. Take, for example

Classis IX 'Evacuatorii'

Ordo I Capitis.

Ordre II Thoracis.

Ordre III Abdominis.

Ordre IV Genitalium

Ordre V Corporis externi

No key is provided for the orders, probably because they were intended as aggregations of genera as an *aide memoire*. The genera themselves are defined by a number of criteria, sometimes, again, by regions, as in the Order Capitis, in the Class Evacuatorii, where the discharges are characterised by their anatomical origins such as the ears, eyes, nose or mouth. Other differentiae are by no means as simple so Linnaeus is unable to follow the systematic procedure, used in his *Genera Plantarum*, of sequentially describing calyx, corolla etc. as afforded him by the fructification of plants. There was nothing remotely equivalent in the world of disease. Each genus is given a pithy definiendum using, where possible, a selection of the three criteria set out in his proem, viz cause, effect, signs, but, since no species are defined, no binomial is given.

Another problem, which Linnaeus attempted to solve and which Sauvages never did, was that of the generality of some symptoms. His first three classes, Exanthematici, Critici and Phlogistici are all characterised by Febriles (*e sanquine in medullam*) and recognised, as stated in a footnote; *FEBRIS dignoscitur Pulsu citato*, which, in the absence of a clinical thermometer was all that was available as a diagnostic procedure. Some fevers were, of course, generalised symptoms of microbial infections of which Linnaeus had no knowledge. Others, however, defined the Ordre II, in the class Critici as Intermittentes. It is, perhaps, no accident that Linnaeus places this group of diseases at the beginning of his nosology since it was the subject of his Doctoral dissertation just as it was that of Sydenham's own master work. Furthermore Sydenham had singled out the 'Quartan Ague' as a prime example as being a discrete 'species' of disease. Linnaeus divides his class 'Critici' into five ordo each characterised by the periodicity of the *Febris paroxysmi*. However, as distinct from his *Genera and Species Plantarum*, each ordinal name is followed by a number in parenthesis. Indeed, all ordinal names and their definienda are peppered with these numbers:

E.g. Classis III. Phlogistici. Ordo I. Membranacei

Genus. Pleuritis. (27)

Inflammatiō (232) Pleurae

Febr. Synocha (12), Dyspnoea (160),

Tussis (155), Haemoptysis (180),

Pleuritica (53)

We find Genus 53, in Classis Dolores, Ordo Intrinseci, is Pleuritica. *Thoracis dolor lateralis punctorius*. This is Linnaeus' master stroke which renders his nosology far more useful than that of his contemporaries and it is the embodiment of his Aph. 77 on the natural method. 'All plants show affinity on all sides, like territories on a geographical map.'

(Plantae omnes utrinque affinitatem monstrant, uti Territorium in Mappa geographia).

Linnaeus' student, Paul Giseke, famously rendered this as a diagram in 1792, some 15 years after Linnaeus' death. Nosology, however, lacked its Giseke. In creating

this system of cross-referencing Linnaeus was boldly rejecting the basic tenets of Logical Division which demanded exhaustiveness, exclusiveness and, above all, no anastomoses. By recognising that these requirements could not apply to disease entities, he substituted the branching hierarchy for a reticulate system with diseases as its nodes. This innovation has never been given its full recognition.

As the years passed both Linnaeus and Sauvages modified their nosologies. In the definitive edition of 1763, Linnaeus had increased his Classes from 9 to 11 and his Orders from 32 to 37 covering 326 genera, but these modifications represented improvements in ‘user friendliness’ rather than any profound changes in philosophy. Linnaeus’ attempt to use an inadequate philosophical paradigm and, what is now seen as a superficial data set, to reach a natural classification of disease was, of course, doomed to failure because here, there was no ‘hidden bond’ to come to the rescue, but he didn’t know that and we must salute his brilliance at meeting so many of the challenges set in trying to establish a practical nosology. In fact, in all his taxonomic endeavours, he managed adroitly to avoid partially sacrificing his sacred aim of placing all the entities of God’s creation in their rightful positions and relationships on the altar of utility. For Sauvages, wedded as he was to the principle of strictly separating theory from practice, as Sydenham and Locke had preached, Linnaeus’ philosophical flexibility was never available.

Although, in many cases, we now understand the molecular basis of disease, there is usually no therapeutic access at this level and the International Classification of Disease (I.C.D. 2007) is still based on symptomatology and it has certainly never bettered Linnaeus’ aphorismic definitions such as the ones for Angina (46), *Faucis dolor cum suffocatione* or Myopia (309), *Oculi visus approximatus*!

Walking down that hospital corridor, past cardiothoracic, oncology and orthopaedics, I asked myself was Linnaeus’ nosology really a ‘Bridge too Far’? when we see its influence on modern hospital design or look up to the sky, with its ‘unanalysed entities’ of cloud genera. In this study I hope, by focusing on Linnaeus’ half-forgotten nosological work, to have shown that, indeed, ‘The strength of any great system shines most brightly in the light of’ ...its limits and to have shed fresh light on his aims and methods. So, when your G.P. next turns from the computer screen and announces that you are suffering from x, y or z, look around the consulting room, you might see the shade of Carolus Linnaeus hovering there, smiling to himself and dangling that *filum ariadnaeum* of which he was so fond.

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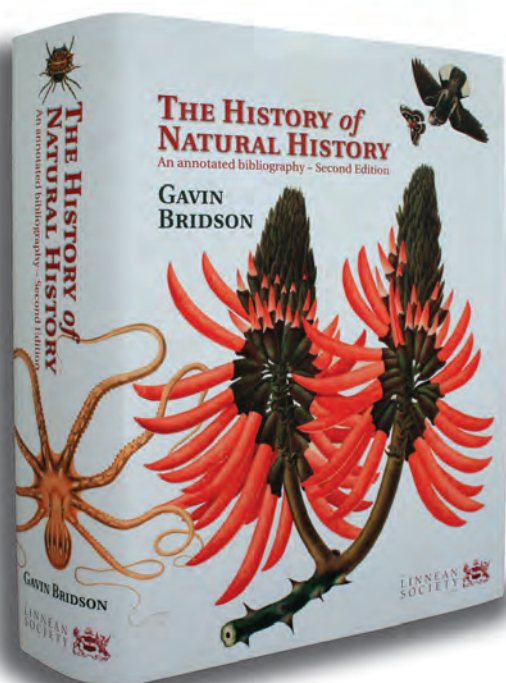
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‘Queene of Bulbous Plants’ – An English 17th Century List of Tulip Names and Evidence of Early Experimental Hybridisation

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The discovery of a hitherto unknown list of tulip names in a 17th century Oxford manuscript throws new light on the phenomenon of tulipmania. More importantly, the preservation in the list of a tulip stamen indicates that one of the most momentous developments in plant science and horticulture – artificial hybridization – may have occurred in Oxford earlier than any previously recorded case.

In the Library of Magdalen College, Oxford, is a manuscript, MS. 238, measuring 14.5cm. (5.7 in.) in length × 9.5 cm. (3.8 in.) in width, containing an index to John Gerard’s *Herball* (1597). It is in ink and in the hand of the botanist John Goodyer (c.1592-1664). Together with printed books and other manuscripts, this index came by his bequest to the College on his death. On some of its pages, the cultivar names of some 45 tulips have been added in pencil. These annotations are in a hand other than Goodyer’s and appear to date from the late 17th to the early eighteenth centuries. I present these tulip names printed below.

The tulip names are printed in alphabetical, not manuscript, order with the manuscript page numbers on which they occur in brackets. I have preserved the orthography and quirks of the original, so spellings and capitalizations are reproduced that may appear erratic or faulty to modern eyes. For the sake of faithfulness to the manuscript, I have not imposed current conventions of cultivar nomenclature (for example, enclosing epithets in single quotation marks). Editorial intervention in the transcription is in square brackets; mention of the same or similar cultivar names in other roughly contemporary books is indicated by the following cue-titles (with page number):

Chesnée: Charles, Sieur de la Chesnée Monstereul, *Le Floriste François* (Caen, 1654).

Gilbert: Samuel Gilbert, *The Florists Vade-Mecum* (London, 1682; 3rd. ed. 1702).

Hanmer, GB: *The Garden Book of Sir Thomas Hanmer Bart* [1659] ed. E.S. Rohde and I. Elstob (London: Gerald Howe, 1933).

Hanmer, PB: Sir John Hanmer, *Occasional Notes and Papers to Serve for a Memorial of the Parish of Hanmer, in Flintshire*, Part I, (London, 1871), pp.55ff; PB = the pocket books.

Marshal: *The Florilegium of Alexander Marshal in the Collection of her Majesty the Queen at Windsor Castle* [1653-82], ed. Prudence Leith-Ross (London: The Royal Collection Enterprises, 2000).

Morin: Pierre Morin, *Remarques necessaires pour la culture des fleurs* (Paris, 1678).

Rea: John Rea, *Flora Ceres & Pomona* (London, 1665), Book I, pp.50-73.

Tradescant: Prudence Leith-Ross, *The John Tradescants: Gardeners to the Rose and Lily Queen* (London: Peter Owen, 1984), tulip names in *Musaeum Tradescantianum*, (London, 1656), pp.290-1.

LIST OF TULIP NAMES

1. Abess Royal (31).
2. Admiral of Constantionp [sic; presumably for 'Constantinople'] (3). 'Admiral' was popular in tulip names; Chesnée has 21 ('Amiral') and Rea 7.
3. Agat Robine (title page). Chesnée (209); Gilbert (49); Marshal (122, no. 42a, with facing colour plate); Rea (56); Tradescant 290). The 'Agat' was a category of striped tulip: 'The third sort of striped ones are called *Agats* and there are also two sorts, the first whereof has but two colours, and the second, call'd *Agatine*, has three, and sometimes more. The *Agatine* is incomparably more beautiful than the *Agat*...' (Henry van Oosten, *The Dutch Gardener: or, the Compleat Florist* (London, 1703), 155). It was very popular: Chesnée lists 55 and Rea 14.
4. Aliebus (title page).
5. Astraea (42). Rea (58) lists it s.v. '*Susanna* is a delightful Flower,... Those of this kind which rectifie [= break, become variegated; cf. OED² s.v. *rectified*, ppl.a., 4, 'Of tulip flowers: having variegated colouring caused by a virus affecting the plant', 1st. rec. in Hanmer *GB*, op.cit., 1659] and have most white, are called *Astreas*, others the *Virgin of Amsterdam*'.
6. Brabason (96). Rea (66): 'Brabason is of several sorts ...'. cf. 'Brabason Swallins' below.
7. Brabason Swallins (title page). Rea (66) lists this as one of his 6 'Brabasons'.
8. Branmorisco (1).
9. Carthago (110). Hanmer, *GB* (19); Hanmer, *PB* (62, 63 ['Carthago Mother']); Rea (63).
10. Dees (1). Marshal (126, no. 44a; 128, no. 45a; 140, no. 51b); Rea (64: '*Deesse*, or (as we call it) the *Prince of Wales*, is of the family of the *Widows*'). Cf. s.v.no. 37.
11. Dutchess (11). Chesnée (231-2: 'La Duchesse'). John Parkinson, *Paradisi in Sole Paradisus Terrestris* (London, 1629), 49.
12. Duke (13). Chesnée (224) lists 3 'Ducs.'; Marshal (96, no. 29a); Rea (52): 'there are divers sorts of *Dukes*' and specifies two; Parkinson, op.cit., 49.
13. Duke of Calabria (25).
14. Eminentissime (37). Chesnée (225: 'Eminente'); Rea (61).
15. Empress (17).
16. General Gouda (39). Chesnée (228: 'General Gonda'); Rea (57: 'General Gowda'). Despite the difference in spelling, the similarity in the descriptions of Chesnée ('est d'un incarnal [misprint for 'incarnat'] fort éclattant, & blanc') and Rea ('is a large Flower, of a bright crimson colour, sometimes well marked with white, but commonly the red hath the mastery; besides the bottom and Tamis ['anther'] are both pale yellow'), suggests reference is to the same flower. Anne Goldgar, *Tulipmania: Money, Honor, and Knowledge in the Dutch Golden Age* (Chicago and London: University of Chicago Press, 2007) says that 17th century Dutch tulip names with 'Admiral' (cf. no. 2 above) and 'General' were not 'those

of real heroes. Instead they were the names of towns, of breeders, and, particularly, of *liefhebbers* [= ‘connoisseurs, fanciers’]. ... They named them for associations of the namer – very often their home, as in Oudenaerde or Gouda (short for Generael der Generaels van Gouda)’ (p. 110). Goldgar has two stories concerning the bulb (General) Gouda (pp. 1, 65), one in a wager.

17. Gen[eral] Scheldenburg (title page, verso).
18. General Zueman (9). Rea (58: ‘General Zweman’).
19. Grand monster (9). Chesnée distinguishes between ‘Monstre double’ (236) and ‘Monstre simple’ (236-7), as does Morin (155: ‘Monstre’ and ‘Monstre double’). Cf. Henry van Oosten, op. cit. s.v. no. 3 above): ‘There is still found another sort of Tulips, of an uncommon shape, of several colours, and frightful to look upon; and for that reason called *Monsters*. You find them of several colours’ (155). This sense of *monster* is unknown to OED².
20. Helena (13; immediately above it is ‘Queen’, but I have taken this as a separate variety). Cf. no. 40. Morin (153: ‘Helene’).
21. Hispanioletta (5). Rea (66) after listing ‘Brabasons’ says: ‘There are other good Flowers ... as Hispaniolet ... these more notably differ from each other in the work or fashion of marking than the *Brabasons*... they are all fine Flowers, and some of them very rare’.
22. Jan Denec (96).
23. John Garret (19). Rea (60: ‘Zweman John Garet, or Chamolet is an old flower...’).
24. Leonora (6).
25. Landskip (19).
26. moulian [?] (11).
27. Mr robon danvers [?] (title page).
28. Olympia (29). Chesnée (239: ‘Olimpe’); Hanmer, *PB* (62); Morin (155: ‘Olimpe’).
29. Omen (9). Gilbert (48); Hanmer, *GB* (18); Hanmer, *PB* (56); Rea (54-55).
30. Painter (17). Cf. Chesnée (243: ‘Peintre’).
31. Paragon (11). Chesnée (244) lists 4 kinds of ‘Paragon’; Gilbert (49, 51, 53) 3; Rea (54, 56, 59, 60, 62, 65, 68) 10; and Tradescant (291) 2. According to Goldgar, op.cit., p.88, *parangonnées* was the French term for newly streaked tulips (*panachées*) which had become fixed.
32. Pluto (33). Gilbert (49); Rea (56).
33. Polydore (23).
34. Poor widdow (3). Marshal (120, no. 41a; 130, no. 46a) lists 2 Widows, and Rea (64) 4, but neither has this one; van Oosten, op. cit. s.v. no. 3, says ‘Out of the ripe Seeds of the Tulip, called *la Veuve*, or *Widow*, you may raise good Flowers’ (154).
35. Poel de Brussell (4). Cf. Chesnée (219, ‘Bruxelle’).
36. Prince of Tyre (35).

37. Prince of Wales (9). Hanmer, *GB* (19); Marshal (126, no. 44a: 'prince of walles'; 128, no. 45a; 140, no. 51b). Cf. s.v. no. 10.
38. Prin[c]ess Turgiana (15) ['c' omitted]. Gilbert (51); Rea (64).
39. Proserpine (27). Chesnée (243); Rea (67).
40. Queen (13). Cf. Chesnée (245: 'Reyne'). Walter Stonehouse (see n.6) has 'Queenes Tulip' in 1640.
41. Royal (7, 19).
42. Royal Parot (5). Gilbert (50) has as names both 'Parrot' and 'Royal Parrot', but I have taken what looks at first blush to be an 'a' and 'y' beside 'Royal Parot' written on two lines (see Plate I) as actually a bracket. Chesnée (241-2) has 8 types of 'Perroquette', and Rea has 'The Parot is of several sorts' (60) and 'The Rich Parot' (60-61; also in Gilbert, 50). Stonehouse (see n.6) has 'The Parrot'.
43. Supreme (21). Hanmer, *GB* (20).
44. Turbant Imp (3). Cf. Rea (59: 'Turban').
45. Zeaboom Stat du Prince (7).

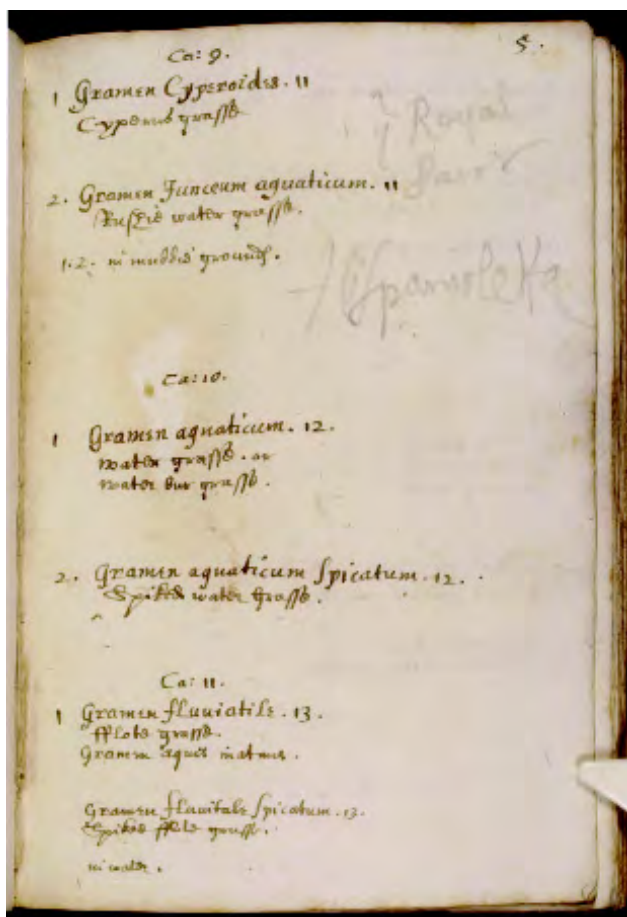


Plate I. MS. Magdalen College, Oxford, 238, p.5, showing pencil additions of tulip cultivar names made at Oxford in the late 17th early 18th century.

We have, then, 45 names, 19 of which cannot be exactly paralleled elsewhere. At the time of ‘tulipmania’ (on this term see my Appendix below), around 1634-7, Sam Segal has stated that ‘we know the names of about seven hundred tulips being cultivated in The Netherlands’.¹ Fewer are recorded elsewhere in Europe. The Sieur de la Chesnée Monstereul, *Le Floriste François* (Caen, 1654) lists 452 cultivars; Pierre Morin, *Remarques nécessaires pour la culture des fleurs* (Paris, 1678 edn.) has 98, though he acknowledges in the Preface to his ‘Catalogue des Tulipes’ that his list is selective: ‘Et qui les voudroit specifier toutes, n’auroit jamais fait’ (p.147). In *Flora Ceres & Pomona* (London, 1665), John Rea, a nurseryman (a term the *Oxford English Dictionary* first records in 1672), lists 204 names², excluding alternative names for the same tulip. In *The Florists Vade-Mecum* (London, 1682; 3rd edn. 1702), Rea’s son-in-law, Samuel Gilbert, a chaplain, writes: ‘*Tulipa*, the Tulip, of which so many Diversities that it were an endless piece of Work to recite and describe them all’ (p.47). Nonetheless, he describes 60, and refers the reader who wants more ‘to Mr. Rea’s *Flora*; wherein he is ample enough, and had the largest Collection of any man in *England*’ (p.53), a collection inherited by Gilbert, who added 3 new ones.³

When we turn to private gardens, the numbers, in England at least, are naturally smaller even in the beds of a connoisseur of tulips, a florist or *liefhebber*, to use the old English and Dutch terms, than are found in the holdings of a nurseryman or in books aiming at some degree of comprehensiveness. That said, John Gerard, *Catalogus arborum, fruticum ac plantarum tam indigenarum, quam exoticarum, in horto Iohannis Gerardi...* (London, 1596), lists ‘*Tulipae infinitae*’ (p.17),⁴ but with no names. In John Tradescant’s plant list of 1634 is the item ‘*Tulipa. Num. 50 diversae flamulae*’, and in the *Musaeum Tradescantianum* (London, 1656) are the names of 30 tulips.⁵ Two Yorkshire gardens of the 17th century have surviving lists of tulip cultivars: the Revd. Walter Stonehouse of Darfield Rectory in the West Riding of Yorkshire, has 40 in 1640,⁶ and his near neighbour, Sir John Reresby of Thrybergh, gives 33 different names in 1641.⁷ Sir Thomas Hanmer made a list of the flowers in his garden at Bettisfield Park, Hanmer, in Flintshire, in 1660 which included 72 tulip cultivars,⁸ and in his manuscript Garden Book of 1659 89 names are listed,⁹ though not all were in his garden.

The questions arise – who wrote the names, when, and why? As has been said, they are written in pencil in the pages of a manuscript index by John Goodyer (c.1592-1664)¹⁰ to Gerard’s *Herball* (1597), but in a different hand and one which looks later than 1664 but still 17th century (albeit possibly creeping into the early 18th century). All Goodyer’s books and manuscripts were bequeathed to Magdalen, and this would indicate that the tulip names were entered after that date by someone at the college. At first blush, Joseph Addison (1672-1719) might seem a candidate: he was elected to a Demyship at Magdalen in 1689; took the degree of B.A. in 1691 and of M.A. in 1693; he became a Probationer Fellow in 1697, and was continuously in residence from January 1696 until March 1698; on the expiry of his probationership he became a full Fellow in July 1698, and in May 1699 left the college for good.¹¹ He wrote an essay on tulipmania in *The Tatler*, 31 August 1710, but the names are not those of the Magdalen list and his attitude is satirical (see further my Appendix below),¹² and, though a man’s handwriting can change, Addison’s is quite unlike that found in the list.¹³

There is no mention in any period of tulips in the gardens of Magdalen,¹⁴ but

directly across the road from the College was the Physic Garden (as the Botanic Garden was then known) of the University of Oxford. There is no mention of tulips in the *Catalogus Plantarum Horti Medici Oxoniensis* (Oxford, 1648), but in the English version of the same year, *An English Catalogue of the Trees and Plants in the Physicke Garden of the Universitie of Oxford*, we have ‘Tulips of divers kindes, *Tuliparum variae species*’ (p.47); and in Philip Stephens and William Browne, *Catalogus Horti Botanici Oxoniensis* (Oxford, 1658) is the entry ‘*Tuliparum quam plurimae species*’ (p.181), and in the Preface the authors state under paragraph 6:

6. Tulipas & Caryophyllos cum aliquot aliis (in quibus est vera lascivientis naturae effigies) vacuimus, quod eo consilio fecimus quia numerosior eorum familia suis Catalogis indigebit; accedit quod nomina vulgo recepta phytographorum autoritate carent, ([p.3]: page unnumbered).

and in the English version, *The Second Part of the Catalogue of the Trees and Plants of the Physick Garden in the University of Oxford* (Oxford, 1658):

6. We have left out the names of the Tulips, and Carnations, with a few others partly because they being so numerous will deserve distinct and particular Catalogues, (which may be set forth in due time) partly because their names as now received are not to be found in any classick author. (page unnumbered).

We may conjecture that someone, presumably a Fellow of Magdalen, crossed the road, and examined the ‘*plurimae species*’ in the Physic Garden, and that the names in the Magdalen manuscript are some or all of the cultivars being grown there.

An interest in tulips, famously not exceptional in the 17th and 18th centuries, would in itself account for our ‘florist’ crossing the High, but a clue to a more specific purpose is found in the preservation between pp.172-3 of what is unambiguously the stamen (both filament and anther) of a tulip, as well as the staining of those pages by what must have been pollen (see Plate II). It does not fly against reason to suppose that the stamen was plucked by the hand which wrote the tulip names. Why would someone preserve just the one stamen?

The answer takes one into early experiments in hybridisation by cross-pollination. There was in the early 18th century a developing interest in the generation of plants, their sexuality, and the role of pollen in the creation of new plants.¹⁵ Richard Bradley,¹⁶ *New Improvements of Planting and Gardening...* (London, 1717), describes one experiment involving tulips:

I made my first Experiment upon the *Tulip*, which I chose rather than any other *Plant*, because it seldom misses to produce *Seed*. Several Years ago I had the Conveniency of a large Garden, wherein there was a considerable Bed of *Tulips* in one Part, containing about 400 Roots; in another Part of it, very remote from the former, were Twelve *Tulips* in perfect Health, at the first opening of the Twelve, which I was very careful to observe, I cautiously took out of them all their *Apices*, before the *Farina Fecundans* was ripe, or any ways appear’d; these *Tulips* being thus *castrated*, bare no *Seed* that Summer, while on the other hand, every one of the 400 *Plants* which I had let alone produced *Seed*.¹⁷

He went on to describe the first artificial hybrid, of which there is record, when Thomas Fairchild,¹⁸ a nurseryman of Hoxton, Middlesex, fertilised a carnation (*Dianthus caryophyllus*) with the pollen of a sweet william (*Dianthus barbatus*):

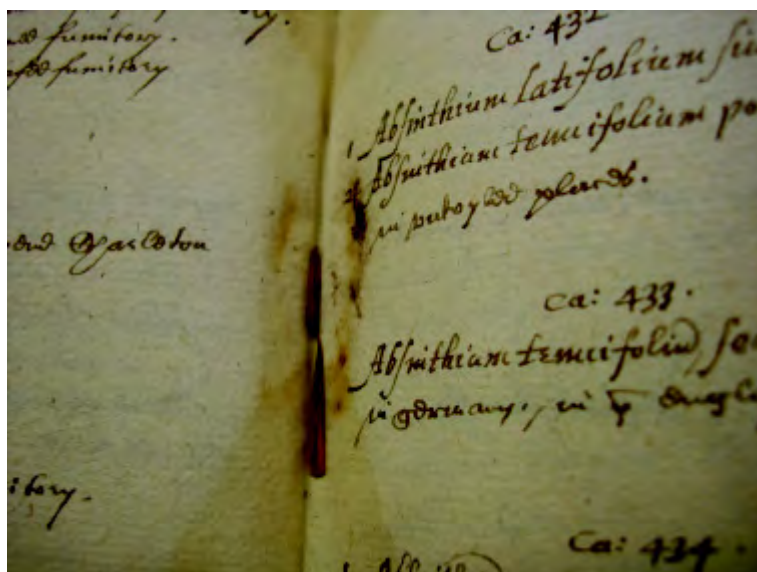


Plate II. MS Magdalen College, Oxford, 238, pp.172-3:
a tulip stamen preserved in the ms.

...the *Carnation* and *Sweet William* are in some respects alike, the *Farina* of the one will impregnate the other, and the *Seed* so enliven'd will produce a *Plant* differing from either, as may now be seen in the Garden of Mr. *Thomas Fairchild* of *Hoxton*, a *Plant* neither *Sweet William*, nor *Carnation*, but resembling both equally, which was raised from the *Seed* of a *Carnation* that had been impregnated by the *Farina* of the *Sweet William*.¹⁹

In Part II of *New Improvements* (London, 1717), Bradley recalls that:

in the second Chapter of my first Part, concerning the Generation of Plants, I have endeavour'd to explain how the *Dust* of one flower will impregnate and enliven the *Seeds* of another, and that from that accidental Coupling the *Seeds* are so chang'd as to produce Plants with Blossoms varying from those of the Mother-plant,²⁰

and, after proposing an experiment, again involving sweet williams and pinks,²¹ he goes on to describe another involving wallflowers and gillyflowers, but where the cross-pollination is left to the contiguity of the planting rather than the transference of pollen by the gardener:

The *Seed Vessels* of this and other single kinds of it [sc. wallflower] as well as their *Flowers*, are so like those of the *Stock July-Flower* [i.e. stock gillyflower], that I am of Opinion they might be made to Impregnate each other's *Seeds* if they were planted nigh enough together and from such coupling, perhaps, might be produced a *Stock July-Flower* with Yellow Blossoms. It is what I design to try, myself, as well as many other Couplings of the like Nature.²²

However, in a later Section, 'Of the Tulip', Bradley attributed new variegations or 'breaking' to impoverished soil: 'It is very plain that a Soil of this Nature must Impoverish the Roots that are set in it, and consequently the *Flowers* must some way or other shew the Distemper of the Roots from whence they spring'.²³

The plucking of one stamen would hardly have formed the basis of an experiment

in sterilization of the kind which Bradley performed on twelve isolated tulips. Rather, its singularity is best explained by its being picked for the purpose of cross-pollination of the kind undertaken by Fairchild with the carnation and sweet william, or of the kind which Bradley wished to encourage between the wallflower and the stock gillyflower. Most probably the stamen was cut so that its pollen could be transferred to one or more different tulip cultivars in the hope that the ensuing hybrid offspring would present new flower colours and patternings.

The flower no sooner blown but blasted is an old emblem of *vanitas* in art and literature, but the tulip appears not only in paintings of life's transience, but in pictures which aimed to preserve, sometimes as in a portrait, what would otherwise perish.²⁴ The tulip stamen of the Magdalen manuscript still, by an accident of time indeed, speaks of a search for the new, of the use of the scientific in the pursuit of beauty, rarity, and variety which have not wholly answered to Time's beckoning on a May morning in Oxford over three centuries ago.

APPENDIX: THE TERM 'TULIPMANIA'

Tulipmania has in the past been much misunderstood,²⁵ and, oddly, the history of the word itself has not been traced. It is first recorded by the *Oxford English Dictionary*, s.v. *tulip*, 5, in Addison's essay in *The Tatler* No. 218 (31 August 1710):

He seemed a very plain honest Man, and a Person of good Sense, had not his Head been touched with that Distemper which *Hippocrates* calls the *τὸ λιλπομανία Tulippomania*; insomuch that he would talk very rationally on any Subject in the World but a Tulip.²⁶

The word *tulip*, like the plant, was, of course, unknown to the Greeks, and the correctly formed Greek was given a spurious authority by inventing a source in Hippocrates.

An earlier instance occurs in a marginalium to Sir Thomas Browne's prefatory letter, 1 May 1658, addressed to Nicholas Bacon, to his *The Garden of Cyrus* (1658). The main text reads: 'while the Ingenuous delight of Tulipists stands saluted with hard language, even by their own Professors',²⁷ and the marginalium to this states: 'Tulipomania, *Narrencruid*, Laurenburg, Pet. Hondius *in lib. Belg.*' Thus the Latin form of the term was already known in England in 1658.

The name 'Laurenburg' is a reference to Petrus Laurembergius, *Apparatus Plantarius* (Frankfurt, 1632), Liber I, 'De Bulbosis', caput xxiv, 'Tulipa':

Germ. Tulipe/Thumpal. Petrus Hondius vocat Tulpel: quo nomine solemus per ignominiam appellare homines inurbanos, & rusticos. Narrenkruijd: quia in nullo flore ita insanitur, ut in Tulipa: nataque inde est Tulipomania. (p.117)

(...which name we commonly apply by way of insult to boorish and rustic folk. *Plant of fools*: for over no other flower do people go mad to the same extent as over the tulip: and thence is derived *Tulipomania*)

We are now back to 1632.

With regard to Petrus Hondius (1578? -1621), I have been unable to trace *in lib. Belg.* His country-house poem, *Dapes inemptae, Of de Moufe-schans* ... (1614; Leiden edn. 1621), III 'Bloem-Hof' (pp.88-120), covers 'Tulipen', pp.89-94, but his term

Narrenkruijd, 'Plant of fools' is not found there.²⁸

Finally, I would cite the diary of the Dutch schoolmaster and poet, David Beck (1594-1634) who on 1 January 1624 mentions as topics of conversation '... van de Tulipanen, Bloemen ende Bloem-narren' ('Tulips, Flowers, and Flower-fools').²⁹

ACKNOWLEDGMENTS

I am grateful to the President and Fellows of Magdalen College, Oxford, for permission to reproduce material in their possession, and to Magdalen's Archivist, Dr. Robin Darwall-Smith, for his assistance. The discovery of the tulip names was made by Mark Griffiths who with characteristic generosity suggested I write them up; he has also purged errors and made improvements. Yoko Otsuki most kindly prepared my manuscript for publication in a way I could never have managed.

The phrase 'Queene of bulbous plants' is from the *Garden Book* of Sir Thomas Hanmer (see n.9, p.18).


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18. On Fairchild see *Desmond* and *ODNB*.
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21. *ibid.*, pp.84-5.
22. *ibid.*, Section X, 'Of the WALL-FLOWER', p.91.
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long-cherished idea that tulipmania was an episode of irrational financial speculation; Goldgar, op. cit., drawing on a profound familiarity with Dutch archives, and not without criticism of Garber (see pp.329, 378-9), goes further, destroying the myth that tulipmania was financial madness, and providing a richer and more complex account.

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Eels are slipping away

Brian Gardiner

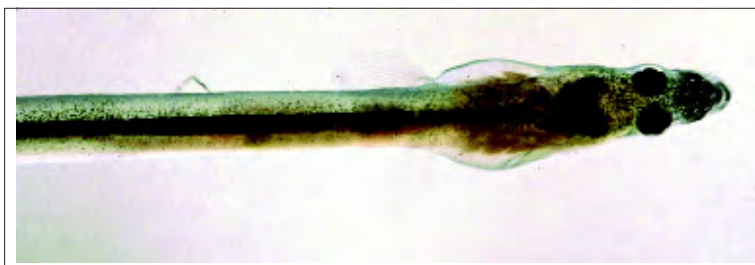
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Many years ago when I was a young lad, in the Spring, around the time of the Severn Bore, gypsies, who my mother informed me came from the Forest of Dean, arrived in the village crying “elvers, live elvers”. The elvers were contained in galvanised baths and transported by horse and cart. My mother would go out with a pint jug and for a few coppers purchase some elvers. She would then par boil them in bacon fat for our breakfast. The elvers were caught in hand nets – like a cradle with a handle five to nine feet long, fixed to a headboard at the nearer, slightly narrower end. The handle is willow, the headboard elm and the net is made of cheese cloth. The elver season lasts from March to May and the elvers are usually caught on the Bore as the ebb sets in.



An adult eel – *Anguilla anguilla*. Photo. P. Morris

Initially, the eel eggs laid in the Sargasso Sea hatch into leaf-like leptocephalus larvae which are swept by the Gulf Stream towards Europe, a journey that may take a year. On reaching the Continental Shelf they change into Glass Eels. In the Spring they begin to move through estuaries into fresh water where they develop pigmentation and are known as elvers. These elvers continue to move upstream and, again, change colour to become brown or yellow eels. It is said that they can live up to 40 years and grow to one metre long. The females are reported to carry as many as 10 million eggs. They then return to the Sargasso Sea, spawn and die! Some of the returning eels were, however, trapped by special gratings let into the outlets of small rivers and lakes and, again, as a boy, I often found female silver eels, as large as 3-4 feet long, in these traps. In the past elvers were far more widespread in their distribution than they are today,



An elver of *Anguilla anguilla*. Photo. P. Morris

reaching North Africa, the Mediterranean, Spain, Portugal, the British Isles, Denmark, Sweden and the coasts of Norway and Ireland.

A separate species, *Anguilla rostrata*, migrates from the Sargasso Sea to North America. *A. rostrata* is distinguished from *A. anguilla* by their myomere/vertebrae counts: the former has 103-11, the latter 110-119. Other differences include the number of branchiostegal, pectoral fin rays and a sexual disparity of size. *A. rostrata* ranges from Greenland and Labrador, Canada to the Gulf of Mexico and Venezuela, Guyana and Trinidad. In the past eel fishing sustained many North American Indian tribes such as the Iraquios and Gnonondonga peoples. Christian Schultz, a nineteenth century traveller reported that the eels found in Lake Oneida were the finest and largest he had ever seen and describes how the native Indians caught them with baskets in the outflow from the lake. Interestingly, the Pilgrim Fathers were also sustained by the abundance of eels!

There are many other species of *Anguilla* (all characterised by the possession of leptocephalus larvae) including *A. mossambica* – an African species – and *A. ausfolis*,



A group of eels. Photo. P. Morris

an Australian form. There is also one species of freshwater eel indigenous to New Zealand and this has been the staple diet of the Polynesian Maoris for some twelve hundred years.

Away from North America and over here in London, the Cockney ‘national dish’ is jellied eels. The eels are chopped up, boiled in stock and allowed to set. As a university student in London it was one of my much-enjoyed dishes. Elvers run in the Thames towards the end of April. Adult eels feed on crabs, prawns, shrimps, small fish and worms in salt water estuaries. In fresh water, on the other hand, everything from leeches, nymphs, caddisfly larvae, crayfish and even freshwater mussels are eaten, and then, as they age, they feed on fish such as perch, rudd and char.

Our rivers once teemed with eels but today far fewer make the 7,000 mile round trip from the Sargasso to Britain and back. It is estimated that, across Europe, elver numbers are less than 5% of their 1980 levels; *Anguilla anguilla* is indeed an endangered species and the fishing of adult eels is said to be suspended. Lough Neagh, in Northern Ireland, once supported the greatest eel fishery in the World but today the run of elvers is no longer enough to support this fishery and, as early as 1985, some 10 million elvers were purchased from the Severn fishery! Theories for their decline include slight shifts in the Gulf Stream’s direction to changes in sea temperature. It is estimated that today, less than a few hundred men still fish for eels with their “Fyke” nets on the Severn and Wye rivers. Slippery as an eel is a common expression we often use but, whether or not it will mean anything to tomorrow’s children no one can tell.

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223rd Anniversary Meeting of the Linnean Society

**held at Burlington House, Piccadilly, London W1J 0BF
at 4.00 pm on Tuesday 24th May 2011**

- 1. The President** took the Chair and welcomed 102 Fellows and their guests to the meeting.

Apologies were received from:

Dr Stephen Palmer	Professor Michael Claridge
Professor David Mabberley	Katarina Heldring-Morris
Jenny Edmonds	Daphne Fielding
Ian Tough	Lady Sue Tunnicliffe
Professor Hililke Ruhberg	Campbell Smith
Charles Prion Pansius	David Hardman
Elaine Shaughnessy	Charlie Jarvis
Pamela Le Couteur	Ian Caldwell
Barry Mapstone	Arvid Uggla
Virginia van der Lande	

- 2. Admission of Fellows.** The following signed the Obligation in the Roll and Charter Book and were admitted Fellows:

Ahmet Aytakin	Paul Barrett
Matt Bentley	Vladimir Blagoderov
Richard Bodenham	Mike Gilbert
Beverley Glover	Ruth Mannion-Daniels
Hazel Marsden	Mark Richardson
Michael Schmitt	Bridget Wilkins

- 3. The Minutes of the Meetings held on 14th April 2011** were accepted and signed.
- 4. Appointment of Scrutineers.** The following were appointed as scrutineers; Professor David Pye, Dr Mary Morris and Professor David Cutler.
- 5. Ballots.** As a result of the ballots:
- a.** The following were elected to Council: **Dr William Baker (B), Dr Joanne Porter (Z), Dr David Rollinson (Z).**

Details of these new Council members can be found in *The Linnean Society of London Anniversary Meeting 2011 Council Agenda and Council Nominations*, circulated with *The Linnean* in March 2011. These nominations, all made by the Council, were for Fellows to replace Dr Mike Fay (B), Professor Terry Langford (Z), and Professor P Geoff Moore (Z).

The President thanked outgoing Council members for their services to the Society.

- b.** The Officers elected were: President **Dr Vaughan Southgate**, President-Elect **Professor Dianne Edwards CBE FRS**, Treasurer, **Professor Gren Lucas OBE**; Editorial Secretary, **Dr John Edmondson**; Botanical Secretary, **Dr**

Sandy Knapp; Collections Secretary, **Mrs Susan Gove** and Zoological Secretary, **Dr Malcolm Scoble**.

c. The Fellows were elected as on the accompanying list.

6. Citations and Presentations of Medals and Awards:

a. The President presented the **2011 Linnean Medal for Botany** to Dr Brian Coppins and the *Botanical Secretary*, **Dr Sandy Knapp** read the citation:

‘Dr Brian Coppins has a strong national and international reputation as a first-class lichenologist. Although he retired in 2009 as a principal scientist from the Royal Botanic Garden, Edinburgh, he continues to contribute his knowledge and expertise in his current position as Research Associate at the Garden.

One of his main areas of research is the taxonomy and biogeography of the lichens of North-West Europe, especially the genus *Micarea*, but he has wide-ranging taxonomic interests, including the South-East Asian Thelotremataceae, and the epiphytic *Lobarion* of the Eastern Carpathians. His research on British lichens focuses on the identification of difficult crustose species (especially sterile crusts), using morphological and chemical characters, and lichen ecology in native Scottish woodlands.

Through his extensive knowledge of lichens in the UK he has made an enormous contribution to lichen conservation, working with the UK government conservation agencies and NGOs. He was a major contributor to the 2009 edition of *The Lichens of Great Britain and Ireland*, has completed IUCN assessments for all British lichen species, and, with his wife Sandy Coppins, has undertaken many assessments of SSIs and Special Areas of Conservation for national conservation agencies. He is contributing to the editing and importation of the records of the British Lichen Society’s lichen distributional database for the NBN Gateway, with some 284,000 Scottish lichen records individually vetted – an enormously valuable dataset for conservation and management. For eleven years he and Sandy have been training lichenologists through field meetings and a very popular annual week-long course at Kindrogan Field Centre. These contributions to UK conservation have been recognised by Plantlife with the joint award to Brian and his wife Sandy of the “Outstanding Contribution to Plant Conservation” in 2009.

By combining his taxonomic expertise with his long interest in lichen ecology, he has significantly increased understanding of lichens in their environments; for example, demonstrating the important significance of sustained ancient woodland in maintaining lichen diversity, and illustrating how appropriate habitat management can ameliorate the effects of climate change on the lichen distribution. He is currently engaged in a Leverhulme Trust-funded project on the identification of lichen diversity on timbers of mediaeval buildings that is providing evidence of the composition of the lichen flora of southern Britain before the industrial revolution. He has led a Darwin Initiative project in Ukraine, a research project on *in-situ* lichen conservation funded by the Esmée Fairbairn Foundation, and undertaken a series of research projects for the Scottish Natural Heritage. To date he has 230 publications.

Dr Coppins’ seminal contribution to the field of botany, particularly lichenology, was recognised in 2010 with the award of the Acharius Medal by the International

Association of Lichenology. The Society is delighted to present him with a further prestigious award today – the Linnean Medal for Botany in 2011.’

Dr Coppins expressed his thanks to the Society for the medal and especially thanked his wife, Sandy Coppins for all her support over the years.

b. The President presented the **2011 Linnean Medal for Zoology** to Professor Charles Godfray and the *Zoological Secretary, Dr Malcolm Scoble* read the citation:

‘Professor Charles Godfray studied Zoology at Oxford and holds a PhD in community ecology from Imperial College. He is Hope Professor of Entomology in the Zoology Department, at the University of Oxford and a Fellow of Jesus College. Prior to his present appointment, he was Director of the NERC Centre for Population Biology based at the Silwood Park campus of Imperial College and Head of Imperial’s Division of Biology. He was elected a Fellow of the Royal Society in 2001 and awarded a CBE in the 2011 New Year Honours.

Charles Godfray is a population biologist and entomologist with broad interests in ecology, evolution, taxonomy and natural history. He has published on population dynamics, community ecology, evolutionary biology and taxonomy. His current research includes three main areas. One of these is on experimental studies of insect-bacteria mutualisms, ecological speciation, host-natural enemy coevolution and indirect ecological effects, using the pea aphid model system. Another concerns the population biology of mosquitoes and other insect vectors of diseases and modelling novel means of vector control. The third area is biodiversity informatics and taxonomy – getting taxonomy online and making it more accessible to a wider user community.

In population dynamics Charles Godfray has pioneered novel mathematical ways of studying age-structured interactions between insects and their natural enemies. His work in community ecology has been largely experimental but has relied heavily on his taxonomic and natural history skills. Using leaf miner and aphid model systems he has pioneered the construction of quantitative food webs to understand insect community structure. The food webs generate hypotheses about the processes that structure insect communities and these hypotheses are tested experimentally. In recent years Professor Godfray’s community-ecology interests have extended to the endosymbiotic bacteria now known to be abundant in insect species. He has also worked on the evolution of host resistance and natural enemy resistance, using *Drosophila* as an experimental system, and also on parasitoid biology.

Having always been interested in taxonomy, he has promoted the need for an authoritative web-based taxonomy for all major groups of organisms, and argued for the provision of an updatable, peer-reviewed system with information that can be made accessible to a wide range of uses. His contributions are coloured by a deep and longstanding interest in natural history.

For his diversity of outstanding research and his contributions to science policy, all of which are rooted in his interest in natural history, the Linnean Society is delighted to award the Linnean Medal for Zoology for 2011 to Professor Charles Godfray.’

Professor Godfray expressed his thanks to the Society for the medal.



The President, Dr Vaughan Southgate (4th from left) with the medal winners after the Anniversary Meeting – from left to right: Professor Charles Godfray, Professor James Lake, Dr Paul Barrett, the President, Dr Brian Coppins, Dr Tina Sarkinen, Ms Margaret Tebbs and Mr Brendan Sayers.

- c. The President presented the **2011 Darwin-Wallace Medal** to Professor James Lake. The citation was read by the *President of the Linnean Society of London, Dr Vaughan Southgate*:

‘The Darwin-Wallace Medal is awarded to individuals who have made major advances in evolutionary biology. Professor James A Lake has made a number of highly significant contributions toward understanding diverse aspects of genome evolution across all kingdoms of life. These include discovering informational and operational genes, developing the complexity hypothesis for horizontal/lateral gene transfer, and rooting the “tree of life, topics on which he has published over 160 papers. The award to be made this evening, most specifically recognizes Professor Lake’s seminal contributions to elucidating the New Animal Phylogeny.

In the mid-1980’s it was becoming clear that ribosomal RNA sequences could be used to determine metazoan relationships. Interpretation of the trees was complicated, however, by the problem of Long Branch Attraction (LBA). By developing new algorithms that were less sensitive to these LBA artefacts, Jim was able to show that “the Annelida-Mollusca lineage is the sister group of an arthropod subgroup”. This finding was contrary to the Articulata hypothesis that was nearly universally endorsed at that time.

With the advent of PCR and increased ease of sequencing rDNA in the 1990’s, Jim’s lab began to focus on the bilateral animals, and recognised that there were questions over the placement of the lophophorate animals – the bryozoans, phoronids,

and brachiopods., During a visit to the University of Texas Jim met Ken Halanych, described the project and invited him to UCLA, to work in the Hillis laboratory, which was then sequencing vertebrate genes. A productive collaboration was established between the Hillis and Lake laboratories and clear DNA-based evidence soon emerged indicating that the lophophorates were not deuterostomes as had been widely believed. In fact, they were most closely related to the mollusc-annelid clade. The result of this collaboration was the creation of a new super-phylum, the Lophotrochozoa containing molluscs, annelids, lophophorates, and other animals.

Shortly after this, the Lake lab teamed up with James Garey, then at Duquesne University, with Rudy Raff at Indiana, and with Clint Turbeville at Michigan. As in his earlier work, Jim quickly recognized that long-branch attraction was a severe problem for the mostly rapidly evolving nematodes and Jim Garey was able to provide rDNA sequences from a number of slowly evolving nematodes in order to bypass this difficulty. This careful sampling was the key to showing that the moulting animals form a clade – called the Ecdysozoa – a second protostomian superphylum sister to the Lophotrochozoa.

Today these early ideas are broadly accepted and have led to a radically new view of bilateral animal evolution profoundly stimulating studies into the early evolution of bilateral animals. The result has been a revolution in our understanding of animal evolution and Professor Lake's pioneering studies laid the foundations for the "New Animal Phylogeny". For this seminal contribution to advancing the study of evolution, I am delighted to present Professor James Lake with the Darwin-Wallace Medal for 2011.'

Professor Lake responded by thanking the Society for honouring him with this award.

d. The President presented the **2011 H.H. Bloomer Award** to Mr Michael Fibiger and Mr Brendan Sayers. The citation for Mr Michael Fibiger was read by the *Zoological Secretary, Dr Malcolm Scoble*:

'At its meeting in January of this year, the Society's Council agreed to the presentation of two H.H. Bloomer Awards, one of which was made to the outstanding Danish amateur entomologist, Mr Michael Fibiger. Following the decision, the Society became aware that Michael Fibiger was seriously ill and unlikely to be able to receive his award today. The Society, therefore, arranged for the presentation to be made by Professor Niels Kristensen, FMLS, of the Natural History Museum of Denmark at the University of Copenhagen. This event took place at Michael Fibiger's home in Sorø on 10th February 2011. Michael gained great pleasure from the receipt of this award, but it is of profound sadness that he died just six days after is presentation.

A photograph of Michael Fibiger receiving the award was displayed on the screen.

Michael Fibiger made a significant and substantive contribution to international entomology, specifically in the field of Danish, and more widely, Nordic moth taxonomy. But his most significant work was the editing of *Noctuidae Europaeae*, a series of authoritative state-of-the-art identification manuals covering the entire European fauna of this major insect family, which includes the 1250 or so species known from this region by the mid 1990s. This undertaking was completed with the publication of the 12th volume in late 2010. A total of ten authors, professional and amateur, contributed

to the series, with Michael Fibiger being sole author of three volumes, co-author of another five, and a driving force behind the completion of them all.

Michael's 2005 and 2006 publications (authored jointly with the renowned professional noctuid specialist Dr J. D. Lafontaine, Canadian National Collection, Ottawa) on the high-rank phylogenetic systematics of the Noctuidae and their closest relatives, clearly surpassed what would generally be expected from amateur workers. The findings emerging from this work showed significant agreement with preliminary molecular analyses and essentially foreshadowed results from recent large-scale molecular studies. Moreover the presentation and illustration of empirical findings on noctuoid structural diversity remain valuable contributions in their own right.

A further field in which Michael Fibiger made significant contributions was his original revisionary taxonomy on the small noctuid moths related to a genus he named appropriately *Micronoctua* (and which he placed in a separate family Micronoctuidae). The realisation that the tiny moths in question actually belong to the Macrolepidoptera prompted him to a search (in the field, and in museum collections largely among unsorted accessions) for related species. He discovered hundreds of species, almost all undescribed, and surprisingly diverse in structure. In three substantial papers published in 2007, 2008 and 2010, Michael made very significant progress in getting to grips with this diversity.

The Society was very pleased that Professor Kristensen managed to present the H.H. Bloomer Award of the Linnean Society of London to Michael Fibiger, and we are delighted tonight to acknowledge Michael's enormous achievements and to note that his legacy lives on through his publications and the many people he inspired and influenced.'

The citation for Mr Brendan Sayers was read by the **Editorial Secretary, Dr John Edmondson**.

'In his role as superintendent of the glasshouses at the National Botanic Gardens in Dublin, Brendan Sayers is in charge of a large collection of exotic plant species, and he played a major role in the co-ordination of the 4th Global Botanic Gardens Congress, when it was held in Dublin in June 2010. Over the years he has enriched the collections at Glasnevin, not least through collaboration with the Belize Botanic Gardens. This has involved several expeditions in Belize, and has resulted in a fantastic *ex situ* collection of Belizean plants, including orchids, both in Belize and in Dublin. A further product of this collaboration was the *Guide to the Orchids of Belize* by Sayers and Adams, published in 2009. In the introduction to that Guide, the authors "encourage you all to enjoy the striking and unusual flowers produced by these plants, to photograph them, to inhale their delicious scents but to leave them exactly where they are for future generations to enjoy."

Brendan's professional focus on the orchids of Belize, combining *ex situ* and *in situ* conservation AND enjoyment of the plants finds a close parallel in his other existence as one of the greatest current advocates for Irish orchids. Outside the Gardens, and independent of his employment, he has made a huge voluntary contribution to improving knowledge and enjoyment of the Irish flora, particularly the native orchids. He is a widely acknowledged expert on the orchids, and (together with Charles Nelson)

he published a handsome book “*Orchids of Glanevin: An Illustrated History of Orchids in Ireland’s National Botanic Gardens*” (illustrated by Wendy Walsh), followed in 2004 by the highly acclaimed book “*Ireland’s Wild Orchids*”, through a fruitful collaboration and friendship with botanical artist Susan Sex. This was followed in 2008 by “*Ireland’s Wild Orchids – a Field Guide*”. These books received enthusiastic reviews and are beautiful additions to any botanical library, personal or institutional. In addition to these books, he has also published numerous popular articles.

Brendan was instrumental in setting up the Irish Orchid Society in 2001 and he has chaired the Society for five of the last ten years. He is also a past committee member of the Irish Garden Plant Society. From 1994 to date, through the Irish Orchid Society, he has led many tours, for members and non-members, to areas of Ireland noted for their rich orchid flora, including the Burren, County Clare, and Mullaghmore, County Sligo, and he is a popular lecturer on Irish native orchids to many different groups.

Having been on two orchid field trips in the west of Ireland with Brendan, his proposers for the H.H. Bloomer award can report that it doesn’t take long in his company to discover his passion for these plants – he is an amateur in the true and original sense of the word. The sun shone throughout these trips, and each day saw more orchid treasures. Highlights included a large population of the diminutive lesser twayblade where invasive rhododendron had been cleared in County Cork and fields white with butterfly orchids in Connemara. He has brought Irish orchids into the public eye in a way that has raised their profile and led to increased conservation activity. For his role in raising the profile of Irish orchids, the Society is delighted to present Brendan Sayers with the H.H. Bloomer Award for 2011.’

Mr Sayers thanked the Society for the award.

e. The President presented the **2011 Bicentenary Medal** to Dr Paul Barrett. The citation was read by the *Collections Secretary, Mrs Susan Gove* as follows:

‘Dr Paul Barrett is currently based in the Department of Palaeontology at The Natural History Museum. An internationally acknowledged and respected intellectual leader in dinosaur biology, Paul’s innovative and creative approaches to addressing a wide range of evolutionary problems have resulted in the award of four NERC research grants in the past five years. He is held in high regard for his increasingly analytical, quantitative and novel approaches to the investigation of wider macroevolutionary mechanisms, centred on addressing problems in dinosaur biology and published high impact international journals. Highlights include the application of GIS to plant-dinosaur interactions through time to investigate hypotheses of dinosaur/angiosperm co-evolution, investigation of hearing and behaviour using CT-acquired anatomical proxy data and statistical analyses of the rock and fossil record during the Mesozoic. These quantitative studies have explored new ground and led dinosaur studies into a new era beyond more traditional qualitative approaches.

Alongside this strand of his research, Paul has made extensive contributions to the taxonomic literature, particularly on the systematics and biology of sauropod dinosaurs. His extensive co-authored review of the group is the definitive encyclopaedic reference work on sauropods as is his review of sauropods through

time, in which he synthesized palaeoecology and large scale evolutionary trends. Paul has also bridged the gap between extinct and extant faunas by analyzing diet and physiology in living reptiles as proxies for hypotheses on diet in extinct reptiles and in the very novel study of inner ear anatomy as a proxy for deducing auditory capability and behaviour in reptiles and birds.

Paul has established a flourishing and extremely productive research group of graduate students, supervising nine PhD students and five MSc/MRes students to successful completion to date. He has also supervised five postdoctoral researchers and all these individuals have begun to establish internationally recognised careers in their own right.

In addition to his research, Paul is well known and respected for his extensive involvement in professional bodies, editorial services to academic journals and conference organizing. He was overall field trips co-ordinator for the first European meeting of the International Society of Vertebrate Paleontology in 2009, which attracted more than 1200 registrants and he is currently Co-Secretary of the Palaeontographical Society, Senior Editor of the *Journal of Vertebrate Palaeontology*, a member of the editorial board of *Biology Letters* and Associate Editor of *Journal of Systematic Palaeontology* and *Geological Magazine*. Paul is strongly committed to the public understanding of science, is a gifted communicator and is at ease addressing every level of audience from critical peers to young children.

In recognition of his exceptional research record and his contributions to the wider scientific community, the Society is delighted to present the Bicentenary Medal for 2011 to Dr Paul Barrett.'

Dr Barrett thanked the Society for the honour of receiving the Bicentenary Medal. He thanked his mentors, colleagues, students and family for their encouragement and support.

f. The President presented the **2011 Irene Manton Prize** to Dr Tiina Särkinen. The citation was read by the *Botanical Secretary, Dr Sandy Knapp*, as follows:

'The winner of this year's Irene Manton Prize is Dr Tiina Särkinen.

Tiina graduated with a first class honours degree in Botany from the University of Edinburgh in 2004, winning the Anderson Henry Prize for the best final year performance. The following year she completed an MSc in Biodiversity and Taxonomy of Plants at the Royal Botanic Garden, Edinburgh, passing with distinction. Based on her outstanding MSc project work on the ginger genus *Reenealmia* and overall performance during her MSc, Tiina was subsequently awarded a 3-month scholarship at RBGE to write up her MSc thesis for publication; from this she produced an excellent first author paper that was published in the journal *Molecular Phylogenetics and Evolution* in 2007.

In 2006, Tiina began her doctoral research in Plant Sciences at the University of Oxford, funded through a scholarship from the Oskar Huttunen Foundation in Finland. Her aim was to combine data from descriptive taxonomy, botanical inventory and molecular phylogenetic analyses to address fundamental questions about plant species diversification. Her study focused on the dry forest biomes of the Andes – Argentina, Bolivia and Peru – which presented her with both opportunities and considerable

challenges. She completed a substantial programme of field, laboratory and herbarium work to generate a large volume of primary empirical data. During her second six-week visit to the Andes, Tiina worked with a small team of local botanists to assemble botanical inventory data for three 1ha plots in the upper Marañón Valley, a superb achievement in the timeframe and one that emphasises her ability to undertake botanical fieldwork in challenging tropical environments.

As part of her doctoral work, Tiina assembled a new monographic account of the legume genus *Amicia*, work that will be published shortly in the prestigious *Systematic Botany Monographs* series. This work showed Tiina's fine attention to detail, excellent eye for plant variation, sound-knowledge of collections-based research and a first-class grasp of descriptive taxonomic methods. In the laboratory, Tiina generated an impressively large volume of DNA sequence data for three different Andean plant genera to produce the sort of high quality, densely sampled and well-resolved phylogenies that were needed to address her questions about plant diversification in the Andes.

Tiina produced an outstanding doctoral thesis entitled *Historical Assembly of Seasonally Dry Tropical Forest Diversity in the Tropical Andes*. The breadth of ideas and data impressed the members of the Irene Manton judging panel; one panel member said he had rarely seen a thesis with as broad a conceptual base. The data have already been put to use by Tiina in the publication of several papers, and there are certainly more to come! She is now at the Natural History Museum working with me on Andean *Solanum*; I am fortunate to be able to work with her (although I had to withdraw from judging this year for that reason!).

Tiina, for your significant achievements to date and with confidence in your potential in the future, we are delighted to award you the Irene Manton Prize for 2011'.

Dr Särkinen thanked the Society for the prize.

g. The President presented the **2011 Jill Smythies Award for published botanical art** to Ms Margaret Tebbs. *Editorial Secretary, Dr John Edmondson* read the citation as follows:

'The winner of this year's Jill Smythies Award is Ms Margaret Tebbs.

From 1967-1991, Margaret worked in the Department of Botany at the Natural History Museum, London as a curator and taxonomist. Here, she produced several accounts of Piperaceae for *Flora Mesoamericana* and other publications and travelled extensively, visiting herbaria in Europe and North America and collecting plants in Central America for *Flora Mesoamericana*. She also spent months in Panama illustrating seedlings for the publication *Seedlings of Barro Colorado Island*.

In 1992, Margaret left the museum to become a full-time freelance botanical illustrator. A specialist in pen and ink work, she is based at the Royal Botanic Gardens Kew. She has published internationally in a range of books, journals, and monographs and in Floras of Egypt, Tropical East Africa, Ethiopia and Somalia. Margaret is a member of the Institute of Analytical Plant Illustration, and the South-West Society of Botanical Artists. In 2006 she was awarded second prize in the Margaret Flockton Awards of the Royal Botanic Garden, Sydney.

Margaret's illustrations, amply demonstrate her remarkable ability, in providing detailed, often life-like drawings. They are well planned, well laid out, clearly executed and so accurate that they are helpful in aiding plant identification within the field. This is exemplified by their inclusion in a number of the handbooks produced by the Botanical Society of the British Isles.

As she is a trained botanist herself, Margaret does not work in isolation of the botanists she is illustrating for, portraying botanically accurate dissections in her detailed plates.

This was noted by members of the judging panel who commented that her illustrations were "full of diagnostic details" and "all look very lifelike". One of the judges summed up the comments of all the panel very succinctly describing Margaret's work as "Quite outstanding" and you will have the opportunity to view some of this work after today's meeting in an exhibition, which Margaret has kindly mounted in the Society's library for this occasion.

In recognition, therefore, of her significant contribution to botanical illustration, we are delighted to present The Jill Smythies Award for 2011 to Ms Margaret Tebbs.'

Ms Tebbs expressed her gratitude to the Society.

8. The Treasurer presented the Accounts for 2010. These are to be found in the 2010 Annual Report.

9. Dr Alan Brafield, a member of the Audit Review Committee read the following statement. 'In accordance with Bye-Law 12.6, I confirm that I attended the Audit Review Committee of the Linnean Society on 14 March 2011 at which the Accounts for 2010 were presented. After a thorough review of the written statement of accounts, together with accompanying notes and opportunities for discussion with other members of the Review Committee (including the Treasurer and a representative of the official Auditors), I am satisfied that the Accounts give a true and fair view of the Society's finances as at 31 December 2010. I therefore move that they be accepted'. This was carried unanimously on a show of hands.

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

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

c. The Treasurer expressed his thanks to all the staff for their commitment and hard work.

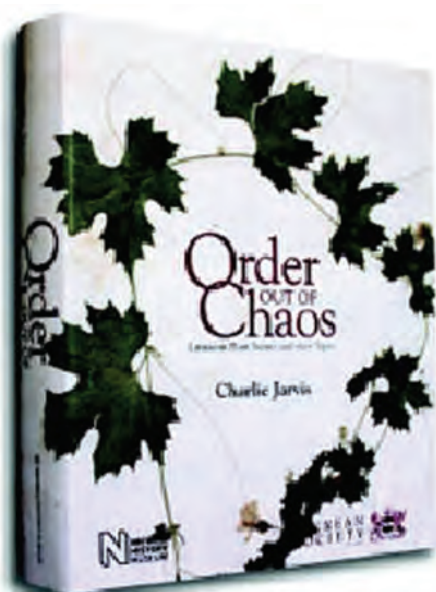
11. The President gave his address on "Complexities of a neglected tropical disease". In this address he discussed how neglected tropical diseases impair the lives of an estimated one billion people, and schistosomiasis, being one of them, infects about 200 million people. Some examples were given of the interactions of schistosomes and consequences from both an epidemiological and disease point of view.

12. On behalf of the Fellows the President was thanked for his talk. Professor David Cutler moved that the President's address be published and circulated and the motion was passed.

Dr Southgate named his Vice Presidents for the coming year as Dr Mike Fay, Dr Keith Maybury, Dr Sandra Knapp and Dr Malcolm Scoble.

13. Any other valid business

There being no other valid business, the President declared the meeting closed, noting the dates of forthcoming meetings. The next Anniversary Meeting will be on **Thursday 24th May 2012 at 4pm.**



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The Linnean Society Programme

2011

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|------------------------|------------------|---|---|
| 20 th Sept. | 6pm
Tues | THE THAMES THROUGH TIME
Danielle Schreve | Burlington House Lecture**
at The Geological Society |
| 20 th Oct. | 6pm*
Thurs | UNDERSTANDING AND EXPLOITING PLANT
IMMUNITY TO DISEASE
Jonathan Jones FRS | Evening Meeting |
| 27 th Oct. | 10.30am
Thurs | INSECT CONSERVATION AND BIOLOGICAL PEST CONTROL –
ECOLOGICAL ISSUES OF SMALL POPULATIONS
† Professor Helmut van Emden (University of Reading)
and Professor Jeremy Thomas (University of Oxford) | Day Meeting ** |
| 28 th Oct. | 10.0am
Friday | ANCHORING BIODIVERSITY INFORMATION:
FROM SHERBORN TO THE 21 st CENTURY AND BEYOND
† Gina Douglas HonFLS | Day Meeting
at the Natural History Museum** |
| 2 nd Nov. | 6.30pm
Wed | ALFRED RUSSEL WALLACE AND THE BIRDS OF PARADISE
Sir David Attenborough CBE FRS HonFLS | Evening Lecture
at the Royal Society of Medicine** |
| 12 th Nov. | 9.30am
Sat | DNA – SOME MODERN PERSPECTIVES AND APPLICATIONS
† Nigel Musset FLS | Day Meeting at University of Bradford** |
| 17 th Nov. | 6pm
Thurs | LINNEAN SOCIETY ANNUAL DEBATE:
‘This house believes that genetic modification is
more of a threat than promise.’
† Andrew Sheppy FLS | Evening Meeting |
| 24 th Nov. | 10.0am
Thurs | THE CHAGOS ARCHIPELAGO: THE WORLD’S
LARGEST MARINE PROTECTED AREA
† Charles Sheppard FLS | Day Meeting** |
| 2 nd Dec. | 6pm
Friday | SMASHING SPECIES: JOSEPH HOOKER AND VICTORIAN SCIENCE
Jim Endersby | Founder’s Day Lecture followed by the Book Sale |
| 9 th Dec. | 9.30am
Friday | SIR JOSEPH DALTON HOOKER - A CENTENARY CELEBRATION
† Royal Botanic Gardens, Kew | Day Meeting**
at Royal Botanic Gardens, Kew |

* Election of new Fellows † organiser(s) ** Registration required

Unless stated otherwise, all meetings are held in the Society’s Rooms. Evening meetings start at 6.00pm with tea available in the library from 5.30. For further details please contact the Society office or consult the website (address inside the front cover).

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