

PULSE

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News from the Linnean Society of London – A living forum for biology

Linnaeus at Work

A Wellcome Trust funded project is studying the Linnaean collections to find out how Carl Linnaeus (1707–1778) assembled, filed, and cross-referenced information about organisms.

Linnaeus's printed works have been studied and analysed ever since their publication, but little is known about his numerous manuscripts, held by the Linnean Society. These manuscripts—which include commonplace books, index cards, and copious annotations in Linnaeus's own books—provide unique insights into the actual, day-to-day work of one of the most famous naturalists of the 18th century. A three-year project, based at the University of Exeter and funded by the Wellcome Trust, is now under way to study these documents in a systematic manner for the first time. We will reconstruct in detail how Linnaeus assembled, filed, and cross-referenced the enormous amounts of information that his printed works contain.

Early Modern naturalists were faced with what has been termed the “first bio-information crisis” in an age restricted to paper-based information technologies. Linnaeus's challenge was to control and order the incessant flow of information which reached him via letters and publications sent to him by correspondents and travelling students from all over the globe. New facts had to be checked against information already available, in order to ascertain their validity and to update existing knowledge. Linnaeus had to find ways by which he could process large quantities of facts rapidly and reliably.

A preliminary study carried out by Staffan Müller-Wille and Sara Scharf in 2007 revealed that Linnaeus experimented with a number of paper-based information technologies and progressively refined his method of information retrieval.¹ As a poor student, Linnaeus used commonplace books to compile and copy information derived from previous authors, but the manuscripts soon became very crowded (Fig. 1). In preparing *Species Plantarum* for its publication in 1753, Linnaeus therefore moved to an open-file system, using fascicules made of folded sheets. Moreover, his famous taxonomic publications—*Systema naturae*, *Genera plantarum*, and *Species plantarum*—provided him with a new platform for continued annotation, each new edition forming a fresh starting point for more annotations and amendments. In a final step, in the mid-1760s, Linnaeus

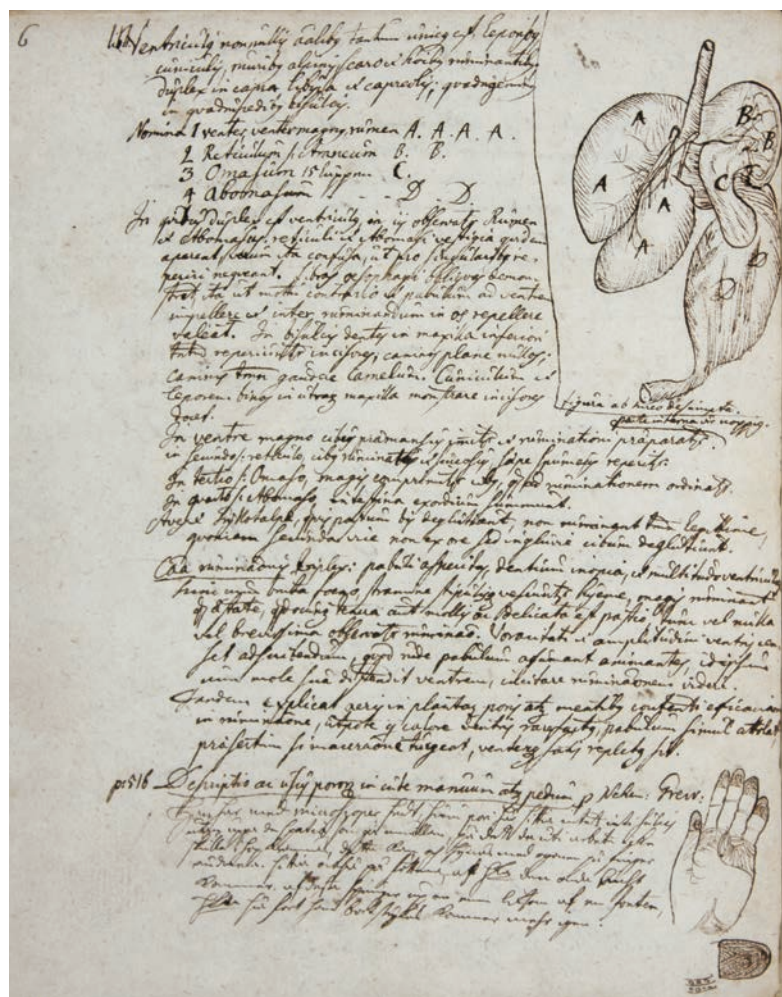


Fig. 1: A page from Linnaeus's *Manuscripta Medica* (1727)

began to use index cards—the first scientist to use this paper tool which was not yet in common use at the end of the 18th century.

These preliminary results indicate that 18th-century naturalists were as dependent on “information technologies” as today's biologists. They, however, had to find their solutions on paper. Linnaeus's publications can be seen as the 18th-century equivalent of today's web-based taxonomic and genomic databases. With their help, it was possible to keep up-to-date with the latest discoveries, while at the same time making one's own contributions to the growing body of knowledge about plants and animals, their medical virtues, and their economic uses.

1 S. Müller-Wille and S. Scharf, 'Indexing Nature: Carl Linnaeus (1707–1778) and his Fact-Gathering Strategies', London: London School of Economics (= No. 36/08, Working Papers on The Nature of Evidence: How Well Do 'Facts' Travel?); URL=<http://www.lse.ac.uk/collections/economicHistory/pdf/FACTSPDF/HowWellDoFactsTravelWPR.htm>



Message from the Executive Secretary

By the time this issue of PuLSe is published, I will have almost completed my first year at the Society. Many thanks to you all for your support on my voyage of discovery! I'm sure that over the summer, many Fellows will also be making voyages of their own and the topic of discoveries is a good umbrella for the articles in this issue of PuLSe.

Fellows enjoyed discovering the Gower for a four-day field trip in May. Vaughan Southgate and his wife were amongst them and Vaughan has summarised the visit on this page. We were thrilled to meet Chris Perrett in April and his article on pp. 4–5 gives just a hint of the exciting discoveries to be made when taking photographs of the natural world. Isabelle Charmantier and Staffan Mueller-Wille have been breaking new ground as they study Linnaeus's manuscripts to find out how he cross-referenced information.

It's also a time for congratulating those who have been recognised for their discoveries, to welcome those who are joining us and to say farewell to those beginning a new voyage. We are delighted to congratulate Linda Partridge, a 2008 Darwin-Wallace Medallist who received a DBE in June 2009. We welcomed Catherine Tanner to the Society as our Office Assistant in July and look forward to welcoming Claire Inman to the post of Communications Manager in September. This post is being vacated by Kate Longhurst and we say farewell to her on p. 8.

Best wishes for the summer period; may it be one of discovery!

Ruth Temple



The Gower Peninsula Trip

Fourteen people from the Linnean Society and Geological Association, mostly unknown to each other, met on a Friday afternoon in May at the National Botanic Garden of Wales. So began a weekend field visit in exploration of what this area has to offer. Dianne Edwards led us through the Garden with an eloquent commentary, and we marvelled at the imaginative layout and the host of specimens. You could spend *days* in the 'giant raindrop'—designed by Lord Foster and the largest single-span glasshouse in the world.

The following morning we met on Caswell Bay in rain—this is Wales, after all—but the sun soon came out and we learned much about the carboniferous limestone which has contributed to the beauty of the Gower Peninsula. Our eminent guide Tony Ramsay took us, by way of a steep descent, to the breathtaking Three Cliffs Bay, and we began to understand why this region was Britain's first 'Area of Outstanding Natural Beauty'.



Sunday morning saw us at Worm's Head, Rhossili. The tide was fortunately well out and Peter Hayward helped us explore the marine life. Later, we examined the flora on the cliffs at Southgate.

Our visit culminated on Monday at the National Wetlands Centre in Llanelli. The weekend, masterminded by Brian Rosen, was fascinating to all of us, whatever our level of knowledge and our evening get-togethers helped cement friendships forged during the trip.

Our thanks go to all those who put this trip together, and to all the team



leaders. We cannot wait for the next one.

Sadly, I have learnt that Mr Michael Griffith CBE, who contributed much to the success of the Gower Field Trip, died on June 27th while walking in Snowdonia. Michael was a past High Sheriff for Clwyd, Vice Lord-Lieutenant for Clwyd, a former chair of the Countryside Council for Wales and a prominent figure in the field of Higher Education in Wales. He will be sadly missed, and our sincere condolences go to his family.

Vaughan Southgate, President

Membership matters!

One of the particularly enjoyable aspects of my job as Executive Secretary is meeting the many visitors who come to the Society. Since I arrived in September, Lynda, our Librarian has very kindly offered me the opportunity to give a brief welcome at the start of the Library and Collections Tours which she runs and it has been good to meet many new faces. Another enjoyable aspect of the role is representing the Society at external events and, in both settings, “home” and “away”, the most frequently asked question has been “What are the benefits of being a Fellow?”

History Society and could take some information with you? Are you hosting a conference or meeting where attendees might be interested in joining? The Certificate of Recommendation can be downloaded from our website and you can contact us if you require further information.

Would you be able to help the Society in other ways—perhaps by giving a talk in a school or becoming part of a directory of “experts” associated with the Society? The October issue of *The Linnean* will include a short “Fellows survey” asking how you can help; please complete it if you can.

Ruth Temple, Executive Secretary



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From the President

As always, I would welcome your comments and suggestions as to how we continue to increase the profile of the Linnean Society and encourage others to join. I should like to add to Ruth’s positive comments. The Society hosts a varied meetings programme and I hope that in the future we will be able to podcast these to the benefit of all our Fellows. The Society is going from strength to strength with the plans for the Tower Rooms, the Education Programme, the digitisation of the collections and its renowned publications. Finally, in this period of credit crunch, £45 per annum to become a Fellow represents, in my opinion, fantastic value. Do tell your colleagues and friends.

Vaughan Southgate, President

So what is the answer? There are the practical benefits—including borrowing rights in the Society’s library and online access to the Society’s journals. In conversation with Fellows though, it is clear that for many it is the “belonging to a network of like-minded people” that is the most important benefit. One Fellow described the Society as “pivotal in my career”, as a result of the introductions made within the Fellowship.

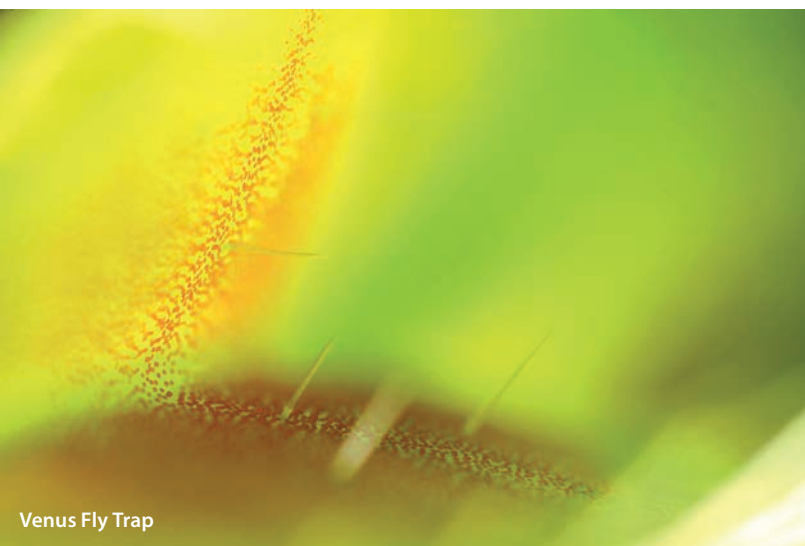
A great strength of the Society is that it attracts Fellows from all walks of life—professional biologists, amateur naturalists, artists and historians of natural history, welcoming all who are committed to the Society’s mission: “the cultivation of the Science of Natural History in all its branches”. As such, it provides a dynamic forum paving the way for a wide variety of collaborations and initiatives. But I have often been surprised when, I have said to an interested visitor, “Would you like an application pack?” to receive the response “Yes, please! I had no idea I could join”. An explanation of the application process, far from being off-putting, reassures the prospective Fellow that the Society has “standards”, but that the “qualification” required is an interest in natural history and hence, they are most welcome to apply.

Can I encourage you to think about the benefits you receive as a Fellow and, moreover, to encourage others to join the Society’s growing Fellowship? Do you know a work colleague or friend who would be interested in joining the Society, who you could recommend as a Fellow? Are you giving a talk to a local Natural



© The Linnean Society of London/Ben Sherwood

A professional commercial photographer by trade, my passion for nature photography began in 2001 when my wife Sue bought me a Venus Fly Trap. I was fascinated by the structure and mechanics of the plant and my interest in carnivorous plants grew as I started to take macro pictures of their working parts. In order to discover more about these fascinating plants I contacted a specialist and showed him a selection of my images. After this meeting he suggested that I enter the Royal Horticultural Society London show, and in 2002 I plucked up the courage to do so. I entered a portfolio of carnivorous plants and to my amazement I won a gold medal.



Venus Fly Trap

Although I still enjoy my commercial work, winning the gold made me realise that I had a real passion for natural history photography. I now travel as much as possible in order to add to the naturesart picture library (www.naturesart.co.uk).

In my photography I like to show all aspects of nature. I particularly like to photograph details that are mostly hidden from the naked eye. I think of myself as an opportunist photographer, taking pictures of whatever I see in that moment.

I am greatly drawn to the rainforests with their marvelous array of fascinating species. The spectacular canopy of trees and foliage coupled with the colourful and often bizarre animal and insect life make for a nature photographer's utopia. The local guides we meet are an invaluable source of information and have taught us a great deal about each area we visit.

*Leave nothing but footprints,
take nothing but photographs,
kill nothing but time.*

This sign is found in the Tiskita Jungle Lodge in Costa Rica—we try to stay in lodges that have a strong conservation policy and support the local community. Tiskita is remotely located on the Punto Banco near the border of Panama. From the lodge itself you can walk with the resident guide in their 800 acre primary and secondary rainforest.

This forest is home to many species of wildlife; white throated capuchins, howler and squirrel monkeys, two and three toed sloths, tyras, agoutis, coatis and kinkajous. There are also over 275 species of bird found here—tanagers, manakins, toucans, aracarís and the endangered Scarlet Macaws to name but a few. The Tiskita Foundation has several ongoing conservation programmes including the re-introduction of these magnificent Scarlet Macaws to the area and a continuing reforestation programme.



Scarlet Macaw

Nature's



Also in Costa Rica is the Esquinas Rainforest Lodge near the village of La Gamba. The lodge employs many people from the village, helping to generate income for the local community. Villagers are also often employed by the nearby *Rainforest of the Austrians* project—Michael Schnitzler, a part-time resident of the area, founded the not-for-profit organisation with a view to purchasing areas of the Equinas rainforest for conservation purposes. By 2008, over 15,000 Austrians had donated \$3,500,000 to this end. Where it could previously have been classed as a 'paper park', all land purchased and supported by the project has been donated to the Costa Rican government as a national park.

Staying in Costa Rica, another haven for wildlife photography is La Selva Biological Station near Heredia, a research station with just a few rooms for visitors. At La Selva you are able to mix with the research students who can give you further insight into the natural world—we were told that the Blue-jeans or Strawberry Poison-dart Frog (*Oophaga pumilio*) could be found in this area. After some searching, I managed to capture its vivid cobalt blue legs and scarlet body before it decided it had had enough and moved on.

Art



All images © Chris Perrett naturesart

translocation exercise in the world) we were incredibly lucky to see African Hunting Dogs (*Lycaon pictus*), now listed by the IUCN as endangered. We were told that a pack of around 20 dogs were very near our lodge. Led by a ranger, we came across them in the middle of a hunt during which they killed an impala. After a few minutes and at tremendous speed they caught another impala; it truly was nature in action, something we were privileged to witness and capture on camera.

Last year we decided that, apart from creating our picture library, we would like to see if we could help to support charities involved in conservation. We had seen first hand the vast areas of palm oil plantations that were once rainforests. We decided to approach the World Land Trust and offered them free use of the images in

our picture library—our images have since been used to help promote their Borneo Appeal and several were utilised in connection with the Great Ape Debate at the Linnean Society of London. The Prince's Rainforest Trust is also making great use of our images. When we see our photographs being employed in this way, it makes us realise how fortunate we have been to be able to visit these countries, and that ecotourism in some ways can help play a supporting role between the needs of a community and those of the environment. I am glad that our images can serve to benefit projects working towards the conservation of these areas.

Chris Perrett



Blue-jeans Poison-dart Frog

On the other side of the world, in Borneo, we explored Sabah (the second largest state after Sarawak) and frequented its orangutan rescue centre set in approximately 70 acres of rainforest. The orangutans are aged between three and seven years and are undergoing second stage rehabilitation where they are encouraged to gradually lessen their dependence on the centre in order to learn the skills they need to survive in the wild. As you would expect, orangutans are a wonderful subject to photograph, with so much recognisable behaviour evident in their eyes and in their mannerisms.

During our time in the Madikwe Game Reserve (a reserve run by the State, private sector and local communities in South Africa and home to Operation Phoenix, the largest game



Basic Photography Tips:

Low light photography: Creativity is the key to low light photography; in the vast majority of circumstances there will be enough available light to allow you to take the photograph no matter how dark it may seem at the time. However, when increasing the ISO for low light levels always be careful of the increased grain/noise.

Flash: My tip, when using flash, is to fire off a test shot on something similar away from the subject to get the correct settings.

Reflecting light back on to the subject: Fold away reflectors are very useful if nearly always impossible to fold away. I prefer to take a small shaving mirror which allows me to control the reflected light on to the subject.

Lens: Know what it is you want to shoot, as you may not be able to carry every lens with you. My favourite lenses are:

200mm macro lens - this enables me to photograph 1:1 and to shoot larger areas with a medium telephoto lens.

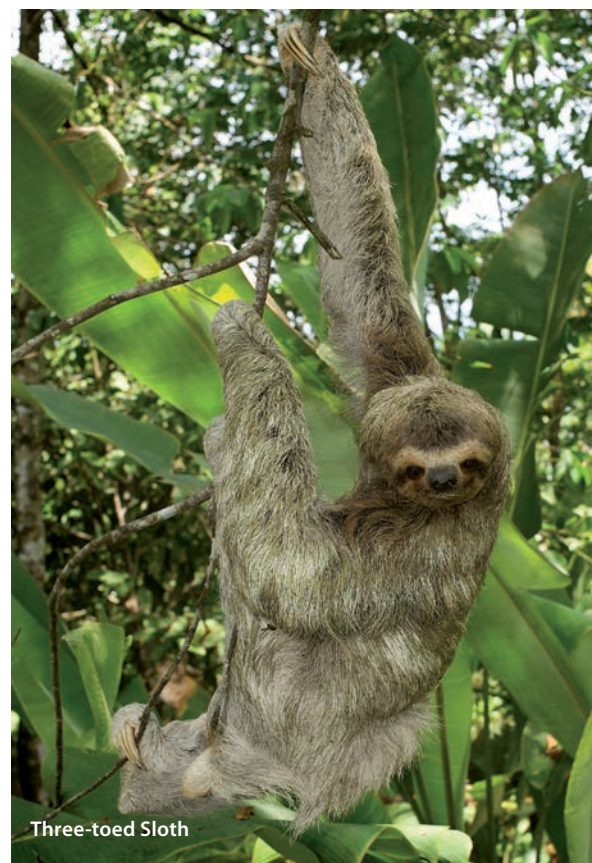
20mm wide angle lens - very good for showing the subject and its environment.

To avoid camera shake when using telephoto lenses (hand held) take care that your shutter speed does not drop below the reciprocal of the length of lens used. For example when using a 200mm lens your minimum shutter speed should be a 200th of a second.

Focus: A problem with low light photography is that auto-focus can struggle, if this happens try using manual focus and focus with the aid of a torch. For macro photography I prefer to use manual focus to enable precise focusing. Use auto focus when photographing fast moving objects.

Grab your first shot (you may only have seconds to capture this).

Compose your second shot taking as many different angles as possible.



Three-toed Sloth

Spotlight on Fellows

Carol Gokce FLS

Carol Gokce's love of the natural world, and passion to help people find out about it, led her to work in the Library of the Natural History Museum, London (1985–2004). Here Carol started the Linnaeus Link Project with funding from the Linnean Society—working in conjunction with Gina Douglas of the Society and the late Tomas Anfalt of the Linnaean Correspondence Project—turning their initial idea into an international online collaboration between libraries with Linnaean material. Carol's connections with the Linnean Society also extend to her invaluable time advising on the Linnean Society Collections Committee from 2002–2009. Post-Natural History Museum, Carol moved on to the Treasury Solicitor's Department, where she led their intranet/website team and business planning. This was followed by the post of Chief Librarian at the Department for Communities and Local Government (DCLG). Carol currently coordinates government digital inclusion policy at DCLG, explaining how digital inclusion helps people use Information and Communication Technology (ICT)—so it's back to helping people again!



© Carol Gokce

One from the very front rank . . . a household word wherever our science is pursued



David Sharp at 29. From Kraatz's collection in the Deutsches Entomologisches Institut.

Thus ran two of the many obituaries when Dr David Sharp died in 1922. No comprehensive bibliography has been produced; the Oxford Dictionary of National Biography claims that such a bibliography would contain 300 items, though our research has already identified 728 works by or about him. A biography produced in 1985 is shorter than some of the obituaries. A major omission is a list of the animals he described, running to 7,167 beetles and 29 other insects.

His *magnum opus*—on water beetles—was published in Ireland in 1882 when he was 42 and still a doctor specialising in mental disorders, never having held a post involving entomology except in a voluntary capacity. The death of his principal patient in 1883 seems to have precipitated major changes in his life, being received into many learned societies including the Linnean in 1888 and the Royal Society in 1890, and becoming the curator of the Zoology Museum in the University of Cambridge and the editor of *Zoological Record*.

How he came to make that change—and to be so prolific as an entomologist—will be the subject of a new biography and bibliography to be prepared by Garth Foster and Hans Fery with the help of our tame genealogist Rob Close. Publication is supported by a grant from the Royal Society. Blending some huge lists with an account of the life and times of the man is quite a challenge and we are searching for anecdotal material to flesh out what could otherwise be a rather dry account.

Herbert Spencer was a one-time lodger with Sharp's father. That and living for 16 years with the insane father of the man who went on to institute the Scottish National Party and, with Keir Hardie, the Scottish Labour Party, must have had an impact! Any ideas on offer will be pursued.

Garth Foster
Email: latissimus@btinternet.com

Conservation Corner

Helga Crouch

Helga Crouch FLS is a botanical artist who specialises in painting only what she sees within the boundaries of her own garden. Her home in Little Samphord, near Saffron Walden, is an old mill set in half an acre of ground. Having started her career as a graphic designer, producing drawings for a space research centre, she later concentrated on natural history and for the past three years has only painted the abundant species in her immediate surroundings.

Having been a Fellow of the Linnean Society since 2001, Helga was also one of the founding members of The Society of Botanical Artists. She studied at Cardiff College of Art and the London Central School of Arts and Crafts. Her work is executed with a very fine brush, one even nicknamed 'the hairless wonder'. Recently, she has started painting with a woodcock pintail feather in an effort to achieve even finer detail. Helga paints from life, even the imperfections she sees, because nature is flawed.

When Helga was 16, she was shown a reproduction of Albrecht Dürer's 'Large Piece of Turf' and this has been a major influence on her work—her studio is decorated with Dürer prints.

Proud of being a Fellow, Helga recently gave the Society one of her paintings and chose the one shown here due to its personal significance—the trowel in the painting belonged to her mother and the rest of the elements grew up around it. The painting also emphasises her interest in antique garden tools.

Janet Ashdown, Conservator



An Unexpected Donation

At the Linnean Society Library we receive a variety of visitors from all over the world. Many are scientists but we also meet artists, gardeners, historians, authors, enthusiastic amateurs and on occasion interested members of the public.

Earlier this year, we had an unusual "walk-in" visitor. A lady came into the Society, not having contacted us in advance, and asked if she might have a look at the Library.

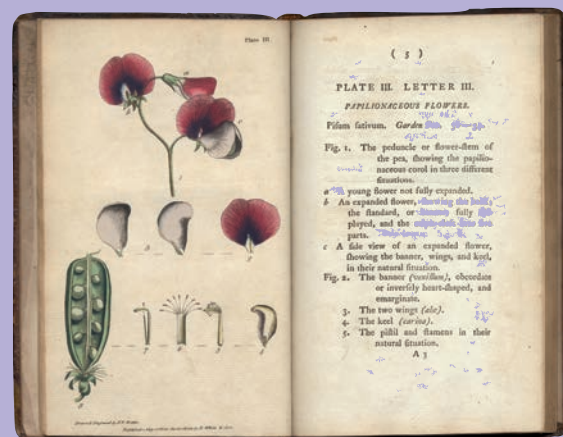
I told her a little about the Society's history and showed her some examples of the things in our care. She told me of her interest in herbal remedies and said that she had settled in St Vincent in the Windward Islands, though was in the UK for a few weeks doing some research.

As the visitor was about to leave, she asked whether we had a copy of the first edition of Thomas Martyn's *Thirty-eight plates [by F.P. Nodder], with explanations, intended to illustrate Linnaeus's system of vegetables ...* (1788). Thinking that she wanted to consult the volume, I checked the online catalogue and found several later editions, but nothing dated 1788. Whereupon she took out from her bag a beautiful leather-bound copy of the book, in very good condition and with the plates in colour.

Remarkably, she presented it to the Library, explaining that she was reluctant to take it back to her tropical island where she feared the humidity would make the volume deteriorate rapidly.

Although we do gratefully receive donations from time to time, rarely are they from as unexpected a source as this. It is a fine addition to our Library.

Lynda Brooks FLS, Librarian



Pisum sativum, the Garden Pea, from Martyn's Botany

Did You Know . . . ?

In June, the State of Tasmania celebrated the 90th anniversary of the birthday of movie star, Errol Flynn. However, unbeknownst to many, the swashbuckler had a keen biologist father, Theodore Thomson Flynn, who was elected Fellow of the Linnean Society in April 1948. Theodore became the foundation lecturer in biology at the infant University of Tasmania in 1909 and went on to become the first Ralston Chair of Biology two years later. His move to Hobart came just two weeks after his marriage to Lily Marelle in Balmain, New South Wales, where he left her, three months pregnant! It didn't help that the university could only pay him a meagre £250 per annum, too little to support a new family.

Errol's Hollywood fame should not overshadow his father's achievements because at the peak of his career, he influenced the shape of Australia's nascent fisheries, immigration and science policies. After World War II, when father and son shared a Caribbean 'expedition' on Errol's schooner, the *Zaca*, Professor Flynn discovered three new fish of the genus *Gibbonsia*. He named the first, *G. eroli*, after his son, the second, *G. nora* after Nora Eddington (whom Errol had married in 1944), and the third, *G. zaca*, after the schooner.

Ben Sherwood, Assistant Librarian

Congratulations to . . .



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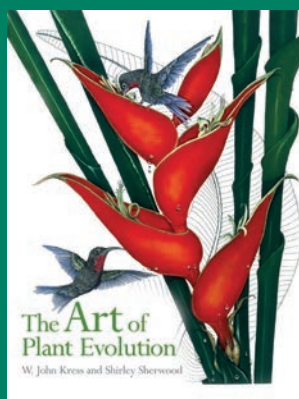
Prof Linda Partridge

Professor of Biometry and Darwin-Wallace medal winner **Dame Linda Partridge**, who was awarded a DBE in the Queen's Birthday Honours in June this year for services to science ... **Dr Azra Meadows FLS**, bio-sedimentologist and Honorary Lecturer in Environmental and Evolutionary Biology at The University of Glasgow, who was appointed an OBE in the January Honours for services to UK and international community relations ... **Dr Sandra**

Knapp FLS, recipient of this year's Peter Raven Award from the ASPT, an award given to the "plant systematist who has made exceptional efforts at outreach to non-scientists" ... **Dr Jenny Edmonds FLS** who is to be presented with the Swedish Jubilee Medal in gold in November by the Board of the Swedish Linnaeus Society in honour of her work during the Linnaean Tercentenary year.

The Art of Plant Evolution

The Art of Plant Evolution is a new exhibition of 136 works from the Shirley Sherwood Collection presented in a sequence using the as yet unpublished Angiosperm Phylogeny Group III classification. APGIII will be published in the *Botanical Journal of the Linnean Society* in October. Each work of art includes information on the painting and artist, the species, plant family and interesting facts on geography, special characteristics, origin of names, and plant uses. The exhibition at the Shirley Sherwood Gallery, RGB Kew, runs from 22 Aug 2009–10 Jan 2010, accompanied by a stunning book by Dr Shirley Sherwood and Dr W. John Kress of the Smithsonian Museum, Washington DC.



© The Board of Trustees of the Royal Botanic Gardens, Kew

Thank You and Farewell to Kate Longhurst

On 18 September 2009, we will say farewell to Kate Longhurst, the Society's Communications Manager, as she moves to University College London to pursue an MSc in Conservation. Kate was initially employed (in February 2007) as the Society's Office Assistant before taking up her current role which has included the never-ending task of maintaining the Society's website! The Society has benefited greatly from Kate's many skills, including the production of eye-catching brochures and flyers, and the efficient administration of events to ensure that the Society continues to communicate effectively with its key stakeholders.



© The Linnean Society of London

More recently Kate has been involved with helping to develop the Society's Education Strategy and we hope that her new experiences will enable her to provide us with fresh insights as to how the Society can encourage and support postgraduate students. We are delighted that Kate was recently elected as a Fellow and look forward to welcoming her to the Society many times in the future.

Forthcoming Events

3rd Sept, 6.00pm

The mirabilis experience—150 years after *Welwitschia*'s discovery
Sara Albuquerque

17th Sept, 6.00pm

The "irritable power" of carnivorous plants: Mary Treat, Charles Darwin and the Language of Flowers
Dawn Sanders FLS

**1st–2nd Oct,
Two day event**

Evolution, ecology and extinction on the smaller Indian Ocean Islands
Robert Prys Jones and Julian Hume

**17th Nov,
Day meeting**

The Galapagos Archipelago: A living laboratory
Sandra Knapp FLS and Sarah Darwin FLS

More information about these and all of the Linnean Society's events can be found at www.linnean.org

All articles welcome! Please submit your articles in electronic format to Leonie Berwick at leonie@linnean.org. Images are also welcome in high resolution format with appropriate permission and copyright.