The International Year of Biodiversity: What Happens Next?

The International Year of Biodiversity – IYOB – conjures up visions of great celebrations of the diversity of life on Earth. This year has indeed been marked by an incredibly rich set of activities, both here at the Linnean Society, in London, in the UK and worldwide, designed to concentrate minds and hearts on the challenge of conserving habitats, species and genes in the years ahead. 2010 was the year of targets – the target adopted by the Conference of the Parties to the Convention on Biological Diversity in 2002 was to “achieve, by 2010, a significant reduction of the current rate of biodiversity loss at the global, regional and national levels as a contribution to poverty alleviation and to the benefit of all life on earth”. It is widely accepted that the target was not met in its entirety – but targets are aspirations, there were good news stories as well.

Here at the Society we began the year with a talk about reintroduction of beavers to Scotland, a real success story; later on in conjunction with the Joint Nature Conservation Committee we discussed the five main drivers of biodiversity loss identified by the Millennium Ecosystem Assessment and prioritised which needed most urgent attention. Our annual joint biodiversity policy lecture with the Systematics Association was a passionate case for linking biodiversity loss and other planetary crises, or we would need to “rent a bigger planet”! The concept of evidence-based conservation – documenting what actually works on the ground – was received with great enthusiasm at a packed summer evening meeting.

I began my own year with a meeting at UNESCO in Paris, one step in setting the next sets of targets. The TEEB report on the economics of biodiversity brought the real cost of losing the rest of life on the planet home – we tend to take ecosystem services underpinned by biodiversity so much for granted that it took a major initiative to bring their true value in monetary terms to the fore. Conferences were held throughout the year, all over the world to develop new targets for the conservation of biodiversity – these culminated in the COP in Nagoya, Japan, happening as I write. In Nagoya, the meeting of Target 1 of the Global Strategy for Plant Conservation (GSPC) was announced – botanists have achieved a working list of all plant species, a true global effort. This year also saw the “completion” of the Census of Marine Life, another incredible effort by the scientific community to assess and document the diversity of life on earth.

When the roadshow that is the COP in Nagoya dies down and new targets for 2020 or 2030 are set, new policies developed and new partnerships established, we must not forget biodiversity, not think that because we had a year of biodiversity we can now move on to something new. Biodiversity underpins ecosystem services upon which the human species, named Homo sapiens or “thinking man” by Linnaeus, depends. IYOB was not just a celebration of the diversity of life on earth, but a platform upon which to develop thoughts and actions to maintain a diverse and dynamic planet. IYOB was only a beginning.

Dr Sandra Knapp FLS
Message from the Executive Secretary

It seems no time at all since I was writing a message for the end of Darwin 200 in 2009, and here we are at the end of the International Year of Biodiversity in 2010. Its been a real privilege to share a wide-ranging programme of events, including some linked with IYOB, this year, and the article from our Botanical Secretary, Dr Sandra Knapp, on the front page of this issue reminds us that there is much still to do in conveying the message of the importance of biodiversity.

Our meetings and events are a central part of our activity. Some cover broad topic areas whilst others have a more specific focus and many of our meetings are organised in collaboration with other organisations – see pp.4-5 for a comprehensive account of the July meeting on Early Events in Monocot Evolution and p.6 for more about our contribution to the Story of London Festival in October 2010. We are fortunate to have a number of Fellows who convey the message of the wonder of natural history through an artistic medium; the final part of Anthony Smith’s travel log from his time as Artist in Residence for the recreated Voyage of the Beagle is included in this issue (p.3) and we are delighted to announce a generous donation of artwork from Margaretha Bååth (p.2)

This year has also been very busy from a facilities viewpoint and the completion of the Tower Room’s project was a significant achievement. The Tower Meeting Room, together with a number of other rooms in the Society is available for hire for meetings and events so please spread the word. We also have a new Archive Centre to hold our treasure-trove of archive material – see Alan Brafield’s article on p.6 for a good example of a “gem” from our archives and p.7 for details of how our conservation team continue to expand their skills to meet the new challenges of conserving many different types of material!

Thank you for all your support throughout 2010 and on behalf of all the staff of the Society, may I wish you a very Happy Christmas and New Year.

Ruth Temple

President’s Greeting

I am delighted to report that the Tower Rooms were officially opened in the summer, and these provide excellent additional facilities to Burlington House. Our next project is to raise funds for the purchase and installation of a lift. This will make all the facilities of the Society easily available to all Fellows, and of course facilitate the movement of material within the Society.

As the International Year of Biodiversity comes to an end, I very much hope that the vital importance of biodiversity and sustainability will be more widely recognised and understood by the population at large, and may even lead to beneficial behavioural changes. The risk assessment by plant scientists at RBG Kew concluded that habitat loss, resulting from the conversion of natural habitats for agriculture and livestock grazing, is the biggest threat to plants’ survival. The report indicated that more than 20% of the world’s plants are at risk of extinction. The Census of Marine Life estimated that 80% of marine life is yet to be described, but warned that habitat loss, over-fishing, pollution, acidification and climate change present a serious challenge to the survival of many species. On a positive note the Society played a role, with others, in convincing the UK government to create the world’s largest marine reserve (545,000 sq km) around the Chagos Islands. I hope that this example will be followed by others in the future. The comprehensive spending review will result in fewer funds being made available for biodiversity within the UK, so it will be even more important that what funds are made available are spent wisely to gain maximum effect.

As we enter the Festive Season I hope I will have the opportunity of meeting as many of you as possible at the final event of 2010 on December 13th at Burlington House. I have no doubt it will be a memorable evening. Furthermore, I should like to take the opportunity of thanking all of our Fellows, all who serve on the various committees, and the staff for their support and work over the past year. All our meetings have been very well attended with vibrant discussion, and I am sure the programme for next year will be equally fascinating: a Field weekend in Somerset, led by Dr Pat Morris, is being planned in June.

I wish everyone a Happy Christmas and successful New Year.

Vaughan Southgate
Getting Close To Darwin

Anthony Smith read Zoology at Cambridge University before starting a career as an artist. He is a Fellow of the Linnean Society and, in 2010, he re-sailed the Voyage of the Beagle on the Clipper the Stad Amsterdam, for a Dutch documentary series (http://beagle.vpro.nl).

Cities such as Rio de Janeiro, Buenos Aires and Sydney, have of course changed immeasurably since Darwin visited in the 1830’s. When the Beagle anchored off the Brazilian city of Salvador de Bahia it was surrounded by tropical rainforest. Wandering in these forests, Darwin was captivated by the lush vegetation and exotic insects, and wrote in his diary: ‘The delight one experiences in such times bewilders the mind’. But when we sailed in, some 177 years later, there were no such forests. It now requires a car journey of several hours, through towns and fields, to reach what remains of them. The Galapagos Islands have also changed considerably. Today there are over 23,000 living on the islands; a number which is growing every year as the tourism industry booms and people flock to the islands from mainland Ecuador. But we did eventually visit a place where I felt truly close to Darwin.

When sailing up the coast of Chile we made a brief stop at a small town called Chaitén, nestled in a protected bay beneath the western mountains of the Andes. We anchored off the town and took a sloop ashore, where we were met by a ranger from the local National Park. Bumping down the road in the back of his 4x4, we headed along the waterfront road that led into town. What had appeared to be an enormous beach was in fact huge quantities of volcanic ash filling up the bay. Window-frames, doors, and even large section of houses stuck out in the bay, set at jaunty angles as the fine pale ash had set like concrete. A minute later we were in the town. Chaitén used to be the capital of its province, with a population of 5,000, but as we drove into the town there was no-one. Not even the ubiquitous dogs that inhabit every street in South America. Only ash. The streets were caked with the fine off-white powder spewed from the volcano, and as we rumbled further into town the ash got deeper. Gradually houses were being swallowed up; some streets were completely buried up to the first floor. It looked like the world’s largest cement truck had tipped over and swamped the town.

The clouds dispersed, revealing the culprit of all this destruction – Chaitén Volcano. It was smoking menacingly. We continued through town until the road came to an abrupt stop at the river. The Río Blanco used to skirt behind the town, but the volcano had triggered a mud-flow, diverting the river through the middle of town, washing away roads and homes. It was the flood that had caused the shifting of silt and ash which had buried the town.

Walking down the empty streets of ruined houses I pictured Darwin alongside me. He had witnessed similar devastation at the Chilean town of Concepción shortly after it was struck by a massive earthquake. I simultaneously felt the awe, horror and fascination with the power of nature that I had read about in his diaries, and it was at this moment, in a place that he himself never visited, that I felt closest to the spirit of Darwin.

It is a bitter & humiliating thing to see works which have cost men so much time & labour overturned in one minute; yet compassion for the inhabitants is almost instantly forgotten by the interest excited in finding that state of things produced at a moment of time which one is accustomed to attribute to a succession of ages.

Darwin’s Beagle Diary
Anthony Smith FLS
Monocots are a major subgroup of flowering plants that include many economically important species, some of them dominant in their habitats, especially grasses. Monocot food crops include cereal grasses, palms, bananas, taro, yams, and onions. Monocots also represent a high proportion of commercially important horticultural plants (e.g. bulbs, orchids, palms, bromeliads) many of which are critically endangered in the wild. In the last two decades the monocot research community has grown to include approximately 300 systematists and allied researchers. This community has significantly increased knowledge of the monocots, not only in phylogenetics, but also in biology and evolution. It has been built through regular quinquennial meetings, with the first hosted at Kew in 1993 (organised by Paula Rudall, Simon Mayo and others). The last was Monocots IV in Copenhagen in 2008. The Early Events meeting was larger in scale than a symposium at a monocot conference, enabling broader linked themes to be explored than is possible in such a symposium and in terms of timing it fell between two such conferences.

At the Monocots IV conference there was relatively little focus on the deep branches of the monocot tree or ordinal relationships, or the early branching taxa themselves, particularly outside the major alismatid radiation, the Araceae. However, since 2008 this situation has changed radically, primarily through two new large-scale projects: (1) MonAtol, in which the entire plastome and mitochondrial genome is being sequenced in 600+ monocot taxa in addition to transcriptomes from 40 taxa, and (2) a Leverhulme-funded project exploring global patterns of Monocot diversity based at Imperial College and RBG Kew, which is examining how traits, environment and geography interact to determine global patterns of dispersal and diversification. The first session of the Early Events meeting on Monocot origins and relationships drew upon data from these two projects, with papers by researchers at the forefront of both of them: Sean Graham (University of British Columbia) and Andy Jones (Imperial College). These talks re-examined the early branching events in monocot phylogeny and the relationships of alismatid monocots to lilioid monocots such as Pandanales and Dioscoreales.
The sessions which followed built on the foundations laid by these presentations to explore the systematics and evolution of the largely aquatic Alismatales and that of the Araceae, the largest radiation of the Alismatalean clade. Papers both synthesised data across the Alismatales as a whole (Donald Les, University of Connecticut; Dennis Stevenson, New York Botanical Garden, part of the MonAtol consortium) and provided updates on findings in the individual families Juncaginaceae, Posidoniaceae and Ruppiaceae, and Hydrocharitaceae (Sabine von Mering, Johannes Gutenberg-Universitaet Mainz; Margarita Remizowa, Moscow State University; Norio Tanaka, Tsukuba Botanical Garden respectively). In the Araceae session the latest data on the molecular phylogeny of the family was presented (Mark Chase, RBG Kew, on behalf of his collaborators Lidia Cabrera & Gerardo Salazar, Universidad Nacional Autonoma de Mexico). This recent research on Araceae phylogeny was then used by Simon Mayo (RBG Kew) to look at the classification of the family, and by Marc Gibernau (CNRS) and Dennis Barabe (Université de Montréal) to look at floral character evolution and the evolution of floral morphogenesis in Araceae, which is defined by its unique inflorescences and flowers.

The final session held at Burlington House dealt with the divergence of the monocots subsequent to the Alismalates, the radiations which gave rise to much of the diversity of lilioid monocots familiar through horticulture, for example. One paper considered the evolution of the fascinating order Pandanales, by Graça Sajo (BUNESP, São Paulo) who looked at the structure and development of unusual floral structures. Robert Scotland (University of Oxford) took an evo-devo approach to the origin of a highly familiar structure, but one with poorly understood developmental origins, the daffodil corona. The final paper by Jerrold Davis (Cornell University) used novel data from the MonAtol project to address the origins of the diversity of the lilioid and commelinid monocot lineages.

The meeting was planned to coincide with the official retirement of Simon Mayo and celebrate his career after 37 years working on Araceae and Monocot systematics at RBG Kew. In recognition of this, Ana Maria Giulietti gave a presentation on the role and importance of Brazilian researchers in monocot taxonomy and phylogenetic research. Fittingly, Professor Giulietti was the first Brazilian researcher to come to RBG Kew as part of the collaboration initiated and developed by Simon Mayo and his colleagues in the late 1970s and 1980s. There was also a presentation on the eMonocot project which is about to begin building a novel biodiversity web resource for monocot plants. In recent years Dr Mayo made a major contribution to the initiation of eTaxonomy through his work on the Creating a Taxonomic eScience (www.cate-project.org) and European Distributed Institute of Taxonomy (www.e-taxonomy.eu) projects.

The Early Events in Monocot Evolution meeting was highly successful in bringing together a broad array of monocot scientists and as a forum to exchange ideas and to generate collaborations in monocot systematics and evolution. Thanks for financial backing from the Annals of Botany Company (to support early career researcher participation), the Systematics Association, the Linnean Society and RBG Kew is gratefully acknowledged. The oral presentations will be used as the basis of a Systematics Association Volume. This will also be called “Early Events in Monocot Evolution” and will aim to provide a coherent textbook of early monocot evolution and systematics for use by all students and researchers working with monocot diversity. Please look out for it in the near future!

Paul Wilkin
Beware Big Birds!

At the meeting of the Linnean Society on 18 January 1853, William Yarrell read a paper which began ‘Some kind friends having supplied me with various particulars relating to the habits of the Great Bustard (Otis tarda of Linnaeus), most of which, as far as I am aware, have not been made public, I have endeavoured to put these materials together, in the belief that they might be found sufficiently interesting to be communicated at a meeting of the Linnean Society; the great scarcity, or rather, the now rare occurrence of the birds in this country, affording but few opportunities for observation.’

One of his informants was John Britton, who supplied a letter in his possession, with permission to use it, that refers to great bustards on Salisbury Plain. Part of it runs as follows: ‘A man, about 4 o’clock of a fine morning in June 1801, was coming on horseback from Tinhead to Tilshead. While one mile from the village of Tilshead, he saw over his head, about sixty yards high as near as he could estimate, a large bird, which afterwards proved to be a Bustard. The bird alighted on the ground immediately before the horse, which it indicated a disposition to attack, and in fact very soon began the onset. The man alighted, and getting hold of the bird endeavoured to secure it; and after struggling with it nearly an hour he succeeded, and brought it to Mr. J. Bartley of Tilshead, to whose house he was going.

‘During the first week that Mr. Bartley had this bird in his possession it was not known to eat anything; however, at length it became very tame, and would at last receive its food from its patron’s hands. Its principal food was birds, chiefly sparrows, which it swallowed whole in the feathers with a great deal of avidity. The flowers of charlock and the leaves of rape formed also other parts of its food. Mice it would likewise eat, and in short almost any other animal substance. This bird was judged to weigh upwards of 20 lbs., and to measure between the extremities of its wings when extended about 5 feet, and its height was about three and a half feet. Its plumage was beautiful; and from its gait, which was extremely majestic, a spectator would be led to infer that it was sensible of its own superiority over others of the feathered tribe. In August Mr Bartley sold this noble bird to Lord Temple for thirty guineas. The Bustard inhabits the extensive downs of Salisbury Plain; but its race is now almost extirpated. It is thought that not more than three of four are now remaining.’

Another of Yarrell’s friends, Frederick Nash, told him that when he was a young man he once saw nine flights of Bustards in one day, not far from Thetford in Norfolk. Yarrell also notes that Gilbert White of Selborne wrote in 1782, that at a lone farmhouse on the downs between Whorwell and Winchester, a carter about twelve years before had seen a flock of eighteen Bustards at one time. But of recent years Yarrell had noted only three instances of this species.

Great Bustards are now being reintroduced to Salisbury Plain, in a programme supported by the RSPB. They are very large birds, over a metre tall and with a wingspan of up to 2.4 metres (nearly eight feet). As reported online by the Telegraph on 10 June this year, the birds have been brought here from Russia, where eggs are rescued from destruction by farming. Females nested on Salisbury Plain in 2007 and 2008, and in 2009 males mated successfully with them to produce young. This year at least four chicks are known to have hatched and a population of about 18 birds has been built up.

The story of the London Festival

The Society was delighted to contribute to the Story of London Festival organised by the Mayor of London in October. Together with colleagues from the Learned Societies and the Royal Academy of Arts which surround the Burlington House Courtyard we organised a series of lectures, one in each venue, under the title “Breaking the Mould.” The series focused on the contribution of the organisations to innovation in the arts, humanities and sciences over 300 years and on their continuing contribution to the intellectual and cultural landscape of London. The series began on October 1st 2010 with a keynote lecture “London’s Learned Societies: Past, Present and Future” given by Lord May, a Fellow honoris causa of the Linnean Society, former Government Chief Scientific Advisor and Past-President of the Royal Society. Ruth Temple and Lynda Brooks, Executive Secretary and Librarian of the Linnean Society, completed the series on October 8th with a lecture entitled “Collections, Classification and Conservation: continuing the Linnaean legacy.”
During the Summer Linnean Society Conservators Janet and Lucy visited the Leather Conservation Centre (LCC) in Northampton for a behind the scenes tour organized by The Society of Bookbinders.

The leather and shoemaking industries have a long history in Northampton, which was an ideal location in part due to a good supply of water from the River Nene and a plentiful supply of oak bark which were both needed for the tanning process. Industries also benefited from the town’s excellent trading location which later included links to the Grand Union Canal. Specialist leather craft knowledge and the leather industry’s long connections with the town led to the relocation of the British School of Leather Technology from London in the 1970s, the founding of a specialist museum and the town becoming home to related leather and tanning associations including The International Council of Tanners and the UK Leather Federation.

The LCC grew out of a need for specialist care of the leather artifacts which were housed at the Museum of Leather Craft, founded by John Waterer and Claude Spiers in 1946. The LCC was founded in 1978 and relocated to its current home at The University of Northampton’s Park Campus in 1997. The LCC is now housed in a purpose built conservation studio that has a large, modular work space which gives Yvette Fletcher, the LCC’s Head of Conservation, and her colleagues the flexibility to work on a number of very different objects at the same time and allows for very large items, such as carriages and car interiors, to be worked on. A wall of floor to ceiling glass doors gives the studio an excellent source of north facing light, ideal for working closely on an object for a long period of time. The studio is also equipped with a fume room, freezer and a book conservation studio.

The LCC takes in objects from museums, historic houses and private clients, and the conservators have the specialist knowledge to care for objects made from leather, fur and parchment. Some of the objects they were working on included a late 18th century porter’s chair which was being cleaned and having areas of wear repaired, an 1870s Apache Native American Waistcoat made from brain tanned deer skin, a 16th century rapier sheath, a silver picnic tea set in a leather case and two leather screens. Due to the variety of objects, conservation treatments are decided on an individual basis and decisions made are dependent on what is appropriate for the object, the type of animal skin used, the tanning processes used, any further chemical and physical treatments a skin has undergone, the restrictions of the object itself and the wishes of the client, all of which need to be considered within the framework of conservation ethics. To help with this process the conservators are able to call on the expertise of object specialists who can help provide a context and history for individual artifacts.

The conservation problems the conservators face vary as much as the materials and the objects themselves. As with paper based objects dirt, tears, abrasions and missing areas are all common. The tanning as thinly pared leather can make the material inherently weaker. Pest damage is also a problem as protein rich leather can easily come under devastating attack from pests which will eat through skins causing untold damage. Fur is particularly at risk from moths and carpet beetle which will eat the root of the hair causing it to fall out. Prevention is always better than cure and storing leather at 16-20°C (colder for fur) and 50-55% relative humidity will mitigate the problem of pests. Infestations can usually be killed off by freezing the objects.

To illustrate the variety of materials they work on, Yvette filled a table with different types of leathers, skins and furs. These included elephants ear, hard wearing kangaroo skin which footballs used to be made from, Art Deco card cases made from ray skin shagreen which when polished has a highly decorative effect, inch thick hippo skin, stillborn lambskin gloves and a sample of rare Russian birch bark tanned reindeer leather brought up from the 1786 shipwreck of the Danish brigantine ‘Metta Catharina von Flensburg’ off Cornwall.

The Linnean Society’s own library holds large numbers of leather and vellum bound books. Creating links with centers of excellence like the LCC gives us access to highly specialized skills and knowledge which help us best ensure the preservation of our collections.

Janet Ashdown and Lucy Gosnay, Linnean Society Conservators
The Linnean Society’s Nepalese Connection

The Linnean Society holds an array of archival material from past Fellows. One collection of note is that of Francis Buchanan-Hamilton, the first Western botanist to visit Nepal in 1802-3. During the expedition he researched the flora and fauna of the region, discovering new plant species, and collected a large number of specimens. Local artists produced watercolour illustrations of many species, 112 of which are found in the collection at the Society. His copious notes can also be found in the archives, notes he hoped would eventually form a Flora of Nepal. Ill health, however, prevented him completing the work so he sent all his specimens, drawings and notes to his friend, and the Society’s founder, James Edward Smith with the request that he complete the work. Smith, however, was too busy to help his friend so it wasn’t until Prodomus florae Nepalensis by David Don and Nathaniel Wallich that some of Buchanan-Hamilton’s Nepalese work was finally disseminated. Disappointingly, the competitive Smith would not allow Don to examine all of the material Buchanan-Hamilton had given him; so many species Buchanan-Hamilton described were not included in Don’s work.

Recent research into the collection has been carried out by Dr Mark Watson, Editor-in-Chief of Flora of Nepal. In October, the Society was delighted to welcome Dr Suresh Chandra Chalise, the Ambassador of Nepal, and his wife. Dr Watson discussed Buchanan-Hamilton’s work with them and displayed some highlights from the collection.

Ben Sherwood, Assistant Librarian

The Opening of the Tower Rooms

“A remarkable transformation”. These were the words of the Linnean Society’s President, Dr Vaughan Southgate, speaking at the opening of the new Tower Room Suite on August 3rd 2010. The Tower Rooms have been developed in recent months into a purpose-built Archive Centre and a first-class meeting room with significant funding from the Wolfson Foundation, the Garfield Weston Foundation and a bequest to the Society.

Situated on the top floor of the building, and within the arch located over the entrance to the courtyard, the Tower Room is an ideal setting for board meetings. Wifi is available for room users as well as a digital LCD projector and a collapsible screen. The Tower Room is available for hire Monday to Friday between 10am and 5pm at £270 per day. Please note that currently the Tower Room is only accessible via 96 steps.

For further details please contact Tom Helps at tom@linnean.org or telephone +44 (0)20 7434 4479 ext 13.

Fellows of the Society will be sad to hear of the death of Ms Susan Darell-Brown in September this year. Ms Darell-Brown was a former member of the Society’s staff.

Forthcoming Events 2011

20th January, 6.00pm
Maintaining the UK as a powerhouse for science, technology, engineering and mathematics
Professor Sir Mark Walport

10th February, 9.30am
Day Meeting
Controlling Marine Invasive Species by Targeting Vectors of Dispersal
Registration available at www.linnean.org

10th February, 6.00pm
Invasions in the sea: The marine biology of maritime history
James Carlton

17th February, 6.00pm
1810 and All That: Robert Brown and nineteenth century biology
David Mabberley FLS

17th March, 6.00pm
What’s so special about British mammals?
Pat Morris FLS

More information about these and all of the Linnean Society’s events can be found at www.linnean.org or contact Claire Inman on +44 (0)20 7434 4479 ext. 11, email: claire@linnean.org