THE LINNEAN

Newsletter and Proceedings of
THE LINNEAN SOCIETY OF LONDON
Burlington House, Piccadilly, London W1J 0BF

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THE LINNEAN SOCIETY OF LONDON

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Edited by B G Gardiner

Editorial

The main article in this issue is concerned with the medical ethnobotany of Australia. Ethnobotany may be defined as the interaction of communities with their flora. In other words, the personal use of, and interaction with herbs, shrubs, trees, fungi and ferns. It also relates to the use of botanical material for adornment, religious rites, emblems of totemic identity as well as more mundane uses such as items of food, fire and tools. The article, however, is mainly concerned with its medical implications as practiced by the Aboriginal Australians.

A second article introduces us to Constantine Samuel Rafinesque, a botanist with a prodigious output of many hundreds of published works. He was appointed in 1819 Professor of Botany and Natural History at Transylvania University in Lexington Kentucky. Today Rafinesque's name lives on not only through the huge number of plant names that he introduced but also as the authority for that great lepidopteran family of winged nymphs – the Nymphalidea. He also typified the Great Lakes freshwater sturgeon, *Acipenser fluvescens*.

The Picture Quiz features the pharmacist Jacob Bell who was so successful in building up his father's business that it is still with us to this day (viz. John Bell and Croyden, Wigmore Street, London). Amongst his many successes were the instigation of the Pharmaceutical Society, the establishment of the School of Pharmacy and the founding of the *Pharmaceutical Journal.* On the day of his funeral, the whole body of chemists, country-wide, closed their premises. He gave his extensive art collection which contained paintings valued in excess of £20,000 to the nation. With no heirs, the business passed to Thomas Hyde Hills, Bell's partner. Eventually the business moved to Wigmore Street in 1912, just around the corner from Harley Street. Here it provides facilities for the consultants as well as other healthcare services such as heart checks and food intolerance testing. The spirit of Jacob Bell lives on.

BRIAN GARDINER

Society News: August/September 2005

Building Works – Courtyard. Not much sunlight in the Linnean Society this summer – we have been in the thick of building works and covered with scaffolding and plastic sheeting. We are now beginning to see results though: the scaffolding is coming down in parts of the Courtyard and Burlington House does look a lot better with clean stonework, new finials and refurbished windows. We now look forward to seeing the restored gates and railings which are being sandblasted and repainted. The scaffolding on the Linnean Society itself should be down by mid-October.

Building Works – Society's Rooms. That does not mean that we shall straightaway return to normal. Our own programme of works has now started with the installation of climate control in two of the basement rooms. That will enable us to provide proper storage for the Smith Herbarium. During September we shall also be removing asbestos in the boiler room

and elsewhere, prior to upgrading our heating system. After that we shall refurbish the second floor and the Meeting Room, so the programme will be continuing into next year. We shall do all we can to avoid inconvenience to visitors and Fellows but hope that you will understand if there are any difficulties.

***Development News*.** The building work described above is the first step in implementing our vision of a high quality venue which will provide meeting facilities for a wide range of scientific societies. Improving access to our premises and to our collections are the major planks of our development campaign and I am very glad to report that we have now been offered our first significant donation by the Lisbet Rausing Charitable Fund. We are immensely grateful to the Fund which is going to provide £500,000 over three years to enable us to digitise major parts of our collections and make them available on line. However we still have a long way to go, so once again we appeal to Fellows not only to support the campaign directly, but also to let us know about potential donors. Equally important is the need to encourage more people to become Fellows of the Society: the more members we have the more effective we can be.

***Design and the website*.** To encourage more members, and to promote awareness of the Society, we are updating our brochures and corporate design. Copies should be available before Christmas – do let us know if you need any of the new brochures. We are promoting the message of accessibility and it is very important that we counter any image of the Society as being exclusive. Our overriding aim is to communicate and enthuse about natural history and the Society welcomes anyone with a serious interest in biology. As part of our efforts to spread that message we are also redeveloping our website; by the time you receive this there should be a re-designed, and, we hope, more comprehensible website up and running. As always we shall welcome your comments.

The List of the Linnean Society. Another task we have successfully accomplished over the summer has been production of a new List, which should reach you soon. We have altered the format somewhat, which I hope makes it easier to use, but the key information remains. We decided that even in this electronic age people appreciate printed information and we shall welcome feedback on it.

Medals and Awards. We have included most of the traditional information about the Society's awards in the List and I do encourage you to read it. There are many ways in which the Society can honour people, and it is important for our credibility that we are seen to select outstanding contributors in their field. I do stress that Fellows are encouraged to make nominations for Medals and Awards; any Fellow is most welcome to contact me in confidence if they want to put someone forward.

Computers and Inclusion. Whilst on the subject of the List, I should mention a letter I have had from a Fellow who suffered concussion in a road accident last year. As a result she is unable to use a computer screen and she is concerned about being cut off from communication with colleagues if everyone assumes that we can all communicate by e-mail. She asks me to pass on the request that people should provide mailing addresses as well as their e-mail address wherever possible. I hope that most people will feel that this is a reasonable request and do their best not to exclude those who, for whatever reason, cannot use a computer.

Wallace Meeting in Sarawak. Alfred Russel Wallace is one of the scientists particularly honoured by the Society: not only did we have his portrait painted a few years ago but we are also responsible for maintaining his grave. Fellows may therefore be interested to learn about a recent conference in Sarawak *Wallace in Sarawak – 150 Years Later: An International Conference on Biogeography and Biodiversity*. It was whilst he was in Sarawak in 1855 that Wallace developed his seminal ideas on biological diversity and organic evolution. His biogeographical theories are still topical for modern science and relevant to policy makers concerned with conservation.

A number of our Fellows were involved in the conference. Lord Cranbrook helped to organise it and contributed to a paper on *Tracing Wallace's Vertebrate Specimens,* whilst Dr John G.Wilson spoke on *Alfred Russel Wallace:The Forgotten Naturalist*. I am sure that they would be happy to provide details for any Fellows who would like to know more.

Conversazione. As you will know the President has kindly agreed to host this years's Conversazione at Chester Zoo. We hope that we shall see a lot of Fellows there, particularly those from Wales, the Midlands and the North of England, who may feel that we do not meet often enough in their part of the world.

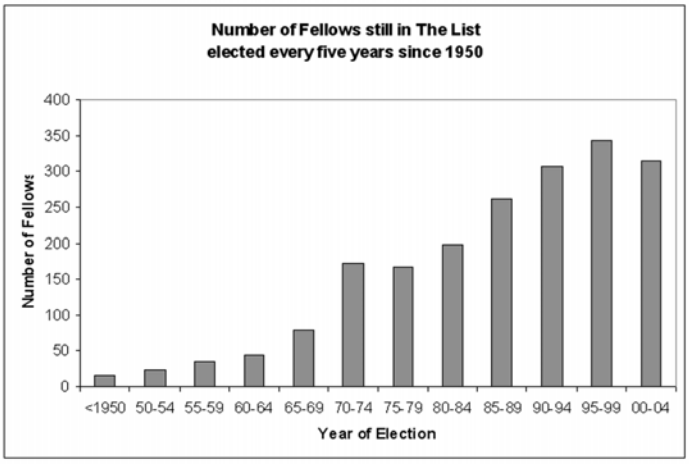
Hooker Lecture and Christmas. As the Conversazione is well before Christmas we plan to have a modest Christmas social event here after the Hooker Lecture by Henry Noltie on Thursday, 8th December. As many of you will know the Hooker Lecture is in itself a special occasion, given infrequently and funded by a legacy from Joseph Dalton Hooker. We shall look forward to seeing as many of you as can make it at what promises to be an interesting and enjoyable evening.

Other Planned Events. There will be plenty of other activities in the run up to Christmas. We have a very high profile lecturer in Chris Stringer FLS FRS on 17th November, and Rick Walden Cox will focus on *Germplasm Collections* in his Brogdale Lecture on Saturday 26th November. That will be followed on 5th December by a major debate initiated by Quentin Wheeler FLS on a key issue for nearly all Fellows – *The Phylo Code vs. the Linnaean Code*. Do take advantage of this opportunity to hear the heavyweights in the field test their ideas against each other.

ADRIAN THOMAS

The List

The List of Linnean Society members, which we hope to send out before the end of this year, contains just under 2000 names, including Fellows *honoris causa,* Foreign members, Associates and Students, as well as Fellows. To our amazement 74 different countries are represented, 19 have ten or more members but 80% of members are from UK, USA, Australia or Sweden. At least 1130 members have been 'admitted' (i.e. signed the charter, undertaking to abide by the rules, and shaken hands with the President) and may therefore vote on matters concerning the Society. It is hardly surprising that quite a large proportion of the members have not been admitted, since this necessitates a visit to London.



A brief analysis of the list during its transition from database to print revealed that 16 Fellows were elected before 1950, the earliest being Professor C. Terence Ingold who was elected in 1927. Intrigued by this, we typed his name into Google and discovered that the current newsletter of the British Mycological Society (*www.britmycolsoc.org.uk*) contains a tribute to Professor Ingold marking his 100th birthday on 5 July 2005. Professor Ingold's length of membership exceeds by ten years even those of Dr Spearing (elected 1937) and Dr John Lund (elected 1939). Mary was appointed to the lectureship left vacant when Dr Spearing retired from Sir John Cass College in 1973 and it is not long since she had a cheerful talk over lunch at the Freshwater Biological Association with Dr Lund, who was still in good form. Association with the Linnean Society clearly encourages longevity*. Needless to say, the majority of current members were elected more recently and recruitment reached a peak in the late 1990s (see figure). As the Treasurer emphasised at the Anniversary Meeting, Council is anxious that more members are recruited as we approach the tercentenary so please encourage as many friends and colleagues as you can to join the Society, particularly the younger ones!

MARY MORRIS and DAVID PESCOD

* See also under Correspondence the letter from Professor A.D.J. Meeuse! Ed.

Library

Figures on Library use, visiting groups and displays will all be given in the January 2006 issue of the Newsletter. This time we are more concerned with reporting on current activities that Library users should be aware of. As you will have seen reported elsewhere in this Newsletter, we have been living with building works both inside and out for the past few months and this has resulted in a lot of disruption for Library and archive holdings. Most of our manuscript and archive storage areas have had to be emptied for one reason or another and many of our manuscript collections, together with the archives of the Society, are now in boxes and stowed away wherever we have managed to find clean and dry space. Portraits hung in areas where work is in progress have also had to be packed away and stored. We have kept records of what is in which box but some boxes are now in their third location,

and are piled 4 deep as available space gets reduced. Please give us advance warning if you think you may need to consult any of these holdings.

As this goes to press we also have plastic dust sheets protecting many of the journal holdings in one basement journal store and corridor, with at least three bays of shelves temporarily relocated (and journals double-stacked!) but we hope that by the time you receive this those shelves will be back to normal. If it looks as if dust is still being generated we may have to leave the protection in place for longer. We have learnt the hard way not to assume that timetables will be kept!

We had the usual summer team of student helpers and this year Sarah Brooks, Kate Conway, Felix Franck, Alison Gayer, Eleanor Hingley, Olivier Holmey, Magda James, Massimo Ruggiero, Igor Sirotic, Shakti Teker, and Kate Vernon, from England, France, Italy and Switzerland, helped to re-shelve all the applied biology books, now together in the shorter top gallery shelves. They also moved books to and from the East Basement stores, cleaned journals, woodwork carpets and tabletops and generally tried to keep the dust levels down as workmen scraped down woodwork on windows and drilled into stonework. The laundering of the dusters gave us visible proof of the benefits of their work. The only benefit of the plastic sheeting still outside is that it has insulated us from any excess heat.

We still have a relatively small number of "displaced" books but are gradually allocating new shelf marks and reshelving items, when that provides a sensible solution. Those remaining with "problem" subject areas are now in some kind of logical sequence and should now be quicker to locate. The flora and fauna sections still need more space but nothing can be done to resolve that until completion of internal renovations provides a more permanent solution.

Our volunteers have withstood all the changes and sometimes gloomy and almost arctic conditions. Arthur Bell has now past letter H of the portrait entries and keeps us entertained with interesting stories. Jeanne Pingree is now nearing the end of her listing of the J.C.Willis materials, showing us tantalising documents from his worldwide travels. John St Quinton has coped magnificently with a multitude of different "sorting things out" tasks ranging from books to journals and Iris Hughes continues to work through listing boxed reprints. We have a new volunteer, Rita Dockery, who is giving us some of her free time to add new entries to the database of past Fellows. We are most grateful to all of them for the various ways in which they are helping us to make our collections and information accessible.

Donations
(Donors shown in bold)

Dr M. Akam: Rookmaaker, L.C. *Calendar of the historical correspondence of the University Museum of Zoology, Cambridge 1819–1911*. 287 pp., Cambridge, University Museum of Zoology, 2005.

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Baron, Michael, *Snowdrops at Brandy Mount House*, 25 pp. illustr. privately, Carol & Michael Baron, 2003.

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Bishop Museum, Honolulu: Staples, G.W. & Herbst, D.R., *A tropical garden flora*. 908 pp., illustr., Honolulu, Bishop Museum, 2005. ISBN 1-58178-039-7.

Loutfy Boulos: Boulos, Loutfy, *Flora of Egypt, Vol.4, Monocotyledons.* 617 pp. illustr. some col., Cairo, Al Hadara, 2005. ISBN 977-5429-41-2.

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Brooklyn Botanic Garden: Chandoha, Walter, *100 Garden tips and timesavers.* 120 pp., illustr. New York, Brooklyn Botanic Garden 2005. ISBN 1-1889538-69-8.

Hanson, Beth [ed.], *The best apples to buy and grow.* 120 p., illustr., New York, Brooklyn Botanic Garden, 2005. ISBN 1-1889538-66-3.

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Cristina Castel-Branco: Castel-Branco, Cristina, *Felix de Avelar Brotero: botaniste portugais (1744–1828).* 329 p., Paris, Centre Cultural Calouste Gulbenkian, 2004. ISBN 972-8462-38-7.

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Trobe, W.M., *The Merlin.* 83 pp., illustr., Brighton, Oriel Stringer (Caliologists Series No.8) 1990. ISBN 0-948122-09-9.

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Mrs V.Hansen FLS & I.K. Foundation & Company: Tärnström, Christopher, *Christopher Tärnström's journal. En resa mellan Europa och Sydosasien år 1746* edited by Kristina Söderpalm and Lars Hansen. 263 pp., illustr. some col., maps. (*Mundus Linnæi* No.1), London & Whitby, IK Foundation, 2005. ISBN 1-900347-80-6.

Heather Jackson: Jackson, Heather, *Romantic readers: the evidence of marginalia.* 366 pp., New Haven, Yale University Press, 2005. ISBN 0-300-10785-4.

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Hoyt, Erich, *Marine protected areas for whales, dolphins and porpoises, a world handbook for Cetacean habitat conservation.* 492 pp., illustr., maps, London, Earthscan, 2005. ISBN 1-84407-064-6.

Prof. G.Ll.Lucas: Burrows, John E. & Willis, Christopher K., *Plants of the Nyika Plateau.* 405pp. illustr., maps, SABONET Report 31, Pretoria, SABONET, 2005. ISBN 1-929976-08-6.

Dr John Marsden: Kent. P. & Chapman, A. [eds.], *Robert Hopoke and the English Renaissance.* 191 pp., Leominster, Gracewing, 2005. ISBN 0-85244-587-3.

Dr Richard S. Peigler: Peigler, R.S. & Naumann, S.A., *A revision of the silkmoth genus Samia.* 227 pp., illustr., map, San Antonio, Univ. of the Incarnate World, 2003. ISBN 0-9728266-0-2.

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Real Jardín Botánico, CSIC, Madrid: Castroviejo, S. [ed.], *Flora Iberica, Vol.XXI Smilacaceae – Orchidaceae.* 366 pp., illustr. some col., Madrid, Real Jardín Botánico & CSIC, 2005. ISBN 84-00-08305-9.

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Govaerts, Raphael & Dransfield, John, *World checklist of palms.* 223 pp., Richmond, RBG, Kew, 2005. ISBN 1-84246-084-6.

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Lentz, D.L. & Dickau, R., *Seeds of Central America and Southern Mexico.* 296 pp., New York, New York Botanical Garden, (Memoir NYBG Vol. 91) 2005. ISBN 0-89327-467-4.

Michelangeli, F.A., *Tococa (Melastomataceae),* 114 pp., New York, New York Botanical Garden (Flora Neotropica monograph 98). ISBN 0-89327-466-6.

Renner, S.S.& Hausner, G., *Siparunaceae.* 247 pp. New York, New York Botanical Garden, (Flora Neotropica monograph 95)**.** ISBN 0-89327-462-3.

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western Russia], 781 pp., map, St Petersburg, St Petersburg Chemical-Pharmaceutical Academy Press, 2000. ISBN 5-8085-0077-X.

Tsvelev, Nicolai Nicolaevicz, [*Problems of theoretical morphology and the evolution of higher plants, selected papers.*] 407 pp., KMK Scientific Press, Moscow-St Petersburg, 2005. ISBN 5-87317-205-6.

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GINA DOUGLAS

Picture Quiz

Jacob Bell
(5th March 1810 to 12th June 1859)

Jacob Bell was born in London on the 5th March 1810, the eldest son of John Bell, the pharmacist and Eliza, the daughter of Frederick Smith another pharmacist, whose shop was in the Haymarket, London, and his wife Sarah. Both families were prominent members of the Society of Friends. It was John Bell who first built up the pharmaceutical business, with the establishment of his Oxford Street Pharmacy in 1778, which, in the hands of his son, acquired a worldwide fame, so much so that John Bell is still with us to this day (viz. John Bell and Croyden, Wigmore Street).

Clue: a Chemist?

When John Bell opened his pharmacy the area was only thinly populated and business was thought to be "a very poor prospect". So in order to create an impression of a brisk trade Bell employed a boy to sit in the window and pound away at an empty mortar. Later he was replaced by Bell's sons, Jacob and then Frederick. Eventually Jacob Bell became the sole proprietor on the death of his father in 1849.

Jacob's education was at the Friend's School at Darlington where, upon completion, he entered his father's business in Oxford Street. Whilst there he attended lectures on chemistry at the Royal Institution as well as lectures on comparative anatomy and on the practice of physics at King's College. During this period he devoted his leisure time to the study of chemistry, converting his bedroom into a laboratory with furnace and other apparatus. He was later given time off from his family business to attend art classes at Henry Sass's Academy in Bloomsbury. Here he was tutored by his cousin, H.P. Briggs RA under whose influence he became an avid art collector, building up what, in his obituary, was described as "a famous collection". During this period he made friends including authors such as Dickens and

Thackeray and artists such as Edwin Landseer with whom he travelled through Belgium and up the Rhine to Switzerland. On his return he commenced work at the Middlesex Hospital where he experimented with anaesthetics such as ether and chloroform, having become a member of the hospital committee and eventually one of its governors.

Bell was a vigilant guardian of the rights of pharmacists and conceived a scheme for a society which would act as an effectual safeguard for protection of their trade and at the same time raise its status. Thus on the 15th April 1841 Bell held a public meeting at the Crown & Anchor, Oxford Street, at which he advocated the formation of the Pharmaceutical Society of Great Britain (now the Royal Pharmaceutical Society). The motion for its formation was moved by William Allen and seconded by his father, John Bell. A further public meeting to approve the regulations, objectives and constitution was held on 1st June 1841. The Royal Charter of incorporation was received on 18th February 1843. At the first meeting of Council held in 1842, it was agreed to establish a School of Pharmacy. Later that year the first lectures on Materia Medica were delivered, followed by the establishment of a laboratory for practical classes. Meanwhile, Bell created the *Pharmaceutical Journal* which for the first eighteen years he not only edited but was also its main contributor. This journal provided Bell with a vehicle for the exposition of his views on such topics as education and the responsibility of the pharmacist. The first issue was published in 1841 (when the editorial in the *Lancet* welcomed this new publication believing it to be "of considerable public benefit") and it has remained more or less unchanged to the present day.

During the 1840's the question of pharmaceutical legislation was much discussed resulting in numerous petitions to Parliament. By 1850 Jacob Bell decided that if the Pharmaceutical Society were to have any hope in influencing Parliament he himself would have to become a member. Accordingly, at a bye election in St Albans in 1850, Bell stood as the Liberal candidate and was elected. In 1852 he introduced a "Bill for regulating the qualifications of pharmaceutical chemists". Sadly, although the bill received royal assent; the very next day Parliament was dissolved, and the act as it eventually became law was emasculated and only partially fulfilled Bell's original intentions. Bell tried twice more to be re-elected but each time was unsuccessful.

By the Spring of 1859 it became clear that Bell was dying, probably of throat cancer. Tidying up his estate he gave the copyright of his journal to the Pharmaceutical Society. After the transfer document was signed it revealed that Bell had never taken a salary and lost some £350 in production costs!

He died on the 12th June 1859. On the day of his funeral, the whole body of chemists countrywide closed their premises. He gave his art collection, which was in his home at Langham Place, and which contained paintings valued in excess of £20,000, to the nation. These included six works by Landseer and works by O'Neil, Sidney Cooper, Charles Landseer, Russ, Bonbear, E.M. Ward, W.P. Frith, Etty and others.

His published works include an *Historical Sketch of the Progress of Pharmacy in Great Britain*, 1843 and *Pharmaceutical Process and Products*, 1862.

His obituary described him as an upright, earnest and excellent man with a powerful personality, someone who rapidly stamped his authority over his contemporaries.

Clue: Said to be responsible for the beginnings of science in Australia.

He was elected a Fellow of the Linnean Society on the 6th March 1832, his Form of Recommendation was signed by: Richard Waring, William Yarrell, Edward Bennett, A. Vigors, J.C. Cox and Joshua Brookes.

Much of the above information has been obtained from the updated Oxford Dictionary of National Biography, 2004.

With no heirs, on his death the business passed to Jacob Bell's partner, Thomas Hyde Hills under whose management the business developed both as a retailer and wholesaler. In 1908 the two operations became two separate companies and the retail operation merged with Charles Croyden and Co., of Wigmore Street. In 1912 the business moved to its current location at 50 Wigmore Street where it was opened by the Lord Mayor. The owner of Charles Croyden and Co., John Marshall avowed to open 24 hours a day, 365 days a year – a promise that was kept until 1966 (today the store is open Monday–Friday 9 am–6.30 pm, Saturday 9.30 am to 6.00 pm).

The pharmacy is situated on the corner of Welbeck Street and Wigmore Street close to Harley Street. With the nearby specialists in mind the consultation suite is not only provided with literature relating to current research (*Nature, The Lancet* etc) but also with information on all newly introduced pharmaceuticals. The company holds two Royal warrants as chemists both to the Queen and her predecessor the Queen Mother. The pharmacy provides a Healthy Heart check, food intolerance testing, while additional healthcare services are provided in a consultation suite at the rear of the store.

BRIAN GARDINER

Correspondence

From: PROFESSOR JIM GREEN Teddington TW11 9LY 18 April 2005

Your picture quiz in the *Linnean* (Vol. 21 No. 2 p.10) shows the chalk portrait by George Richmond of Sir Joseph Dalton Hooker (1817–1911) at the age of 38.

I think your clues were a bit peripheral, you might have mentioned that he also did a bit of botany, and became President of the Royal Society.*

From: DR CHARLES SHEPPARD FLS charles.sheppard@warwick.ac.uk

In 1996 there was a large research expedition to the British Indian Ocean Territory (BIOT), which the Linnean Society later supported strongly in the form of publishing many of its results in a very attractive volume in its series *Linnean Society Occasional Publications* (Sheppard and Seaward, 1999). The timing of that expedition was fortuitous, coming just before most corals, soft corals and other benthic coelenterates in the Indian Ocean were killed by the 1997/8 warming. In this region, mortality on coral reefs was nearly total from the surface to variously 15 or 40 m depth.

Ten years on there will be another expedition, starting February 2006. It already is (nearly) fully funded by parts of the UK government and other bodies, including the loan of the ship needed to access the five atolls and numerous offshore banks and reefs, which collectively spread over an area the size of southern England.

The Chagos Archipelago (BlOT's geographical name) is generally very inaccessible for political and geographical reasons, yet has been found to be a 'stepping stone' for marine species in the East-West flow across the Indian Ocean. Biogeographically it appears to be a key location. It is also almost totally unpolluted over most of its range, lacking the direct human impacts which have so severely afflicted many other Indian Ocean states, including those down-stream of its larval supplies. Notwithstanding the world-wide impacts it suffered from warming, it serves as a reference site for many of the severely impacted and overexploited states elsewhere. It shows what the marine life should be like – an ecological 'baseline' which has not been shifted by human impacts. Despite its importance in this respect, scientific visits are extremely rare, though my own visits in another capacity have shown that recovery from 1998 is strong.

Almost in the manner of expeditions of old when expeditionary travellers would collect specimens for scientists or institutions 'back home', I am able to offer some restricted 'services' through the Linnean Society, to scientists who would like specimens. I have received several requests for tissue for DNA analysis from sufficient people to suggest that I should organise this element in a more systematic way. The offer is mainly for tissue samples only; we are, for example, offering samples of preserved fin clippings of grouper sufficient for DNA analysis to answer biogeographic questions about this pressured and valuable group of fishes, but we cannot offer kilos of fish.

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*I intend to write an article on the Picture Quiz in a future *Linnean* in which I shall chart both its development and design. Ed.

If one or two more readers respond to this then I can probably fit their requests into the existing programme. If there are more I might be able to offer space for a pair of diving collectors who would be devoted to this. The cost would be 'at cost'. There is also a possibility of processing samples in-house at Warwick University, which would of course attract a separate set of charges, agreed on a case-by-case basis. Processing could include DNA extraction, PCR amplification and sequencing of selected amplicons of interest in phylogenetic studies.

Altruism is not the only life history trait of this expedition. Its own evolutionary success, like all life, depends on achieving the most for the least. The overarching theme of the expedition is to clarify and demonstrate the ecological and biogeographical importance of the Chagos marine biota, leading to improved measures for its conservation – and that of other impacted areas in the region. The number of places I can take is of course limited, so by tapping into a wider network of interested scientists and labs, both aims can be significantly furthered. If readers are interested in any commercial or symbiotic relationship, please contact me directly.

Sheppard, C.R.C. and Seaward, M.R.D. (eds.) 1999. Ecology of the Chagos Archipelago. *Occasional Publications of the Linnean Society of London*. Vol. 2. pp.350.

From: PROFESSOR A.W.F.EDWARDS University of Cambridge,21 July 2005

It was delightful to read Sir Christopher Zeeman's "Catastrophe theory applied to Darwinian evolution" from *Understanding Catastrophe* [*The Linnean* 21(3)] with its insights into evolutionary changes. As he wrote at the outset, 'The easiest way to explain the method [analysis of a model by catastrophe theory] is to describe a particular example', in this case Darwinian evolution, so it is no criticism of his elegant exposition to sound some notes of caution about his model, which is a pre-Mendelian view of Darwinian theory.

The outstanding work of the 'evolutionary synthesis' which incorporated the Mendelian model into the theory of natural selection was R.A.Fisher's book *The Genetical Theory of Natural Selection* published in 1930. Of its many insights two in particular must be mentioned. The first is *the fundamental theorem of natural selection* relating the rate of increase in the 'fitness' of a population to its genetic variance in fitness (Sir Christopher actually uses 'unfitness' the better 'to exploit the intuition of a ball rolling downhill') and the second is Fisher's description of sympatric speciation.

It was this *fundamental theorem* that led the American geneticist Sewall Wright to advance his theory of the 'adaptive landscape', or 'adaptive topography' as it is sometimes called. Populations were supposed to climb up under natural selection, exactly as a ball rolls downhill. But subsequent work showed that it was too naïve a metaphor for Mendelian populations. Though Fisher's theorem was widely misunderstood for many years it has recently become clear that *his* intuition was much deeper. His theorem only refers to that part of the change in a population's fitness that can be ascribed to the changes in its gene frequencies under natural selection, and Fisher was always at pains to deny any hill-climbing (or ball-rolling) analogy. 'Selective tendencies are not, in general, analogous to what mechanicians describe

as a conservative system of forces. To assume this property is one of the gravest faults of Wright's formulation' (1958).

Fisher had earlier written to the Japanese population geneticist Motoo Kimura in 1956 in the same vein:

'In considering the original statement of what I ventured to call 'the fundamental theorem of natural selection', I had, of course, considered the relation between such a situation and that in which a potential function existed, for my mathematical education lay in the field of mathematical physics. .... I do not question that the selective intensities acting instantaneously may well be equivalent to those derivable from such a function, but I think it should be emphasized that both changes in time, that is in the environmental *milieu* and in the gene ratios themselves, that is the heritable constitution of the organism, will change this virtual function in a way that cannot be specified in terms of the quantities used in formulating the fundamental theorem'.

On the question of speciation, Sir Christopher describes an alternative to allopatric speciation: 'By contrast our cusp catastrophe model requires only one somewhat mild hypothesis that different ends of the domain favour the evolution of different forms. Using a universal mathematical model we have then deduced that a frontier will appear in the heartland of the species. It is no longer necessary to appeal to allopatric speciation as the main cause of speciation'.

Here it is necessary to quote at length from *The Genetical Theory* (p.125 'Fission of species'):

'The close genetic ties which bind species together into single bodies bring into relief the problem of their fission – a problem which involves complexities akin to those that arise in the discussion of the fission of the heavenly bodies, for the attempt to trace the course of events through intermediate states of instability, seems to require in both cases a more detailed knowledge than does the study of stable states. ... It is, of course, characteristic of unstable states that minimal causes can at such times produce disproportionate effects; in discussing the possibility of the fission of species without geographic isolation, it will therefore be sufficient if we can give a clear idea of the nature of the causes which condition genetic instability'.

Fisher goes on to 'consider the case of a species subjected to different conditions of survival and reproduction at opposite ends of its geographical range' and he explains in detail how genes may be expected to diffuse along the gradient. 'The constant elimination in each extreme region of the genes which diffuse to it from the other, must involve incidentally the elimination of those types of individuals which are most apt to diffuse'.

'The effect of such a progressive diminution in the tendency to diffusion will be progressively to steepen the gradient of gene frequency at the places where it is highest, until a line of distinction is produced, across which there is a relatively sharp contrast in the genetic composition of the species. Diffusion across this line is now more than ever disadvantageous, and its progressive diminution ... will allow the two main bodies of the species to evolve almost in complete independence'.

A catastrophe: Catastrophe theory, like chaos theory, broadens our understanding of the

ways systems may behave. Mendelian evolutionary theory teaches us that hill-climbing analogies are dangerous (and it has been quite a hard lesson). Both have their place.

What would be really delightful would be to know whether Sir Christopher ever discussed evolution with Fisher during the nine years from 1953 to 1962 when they were simultaneously Fellows of Gonville and Caius College, Cambridge. Fisher died in 1962, just before catastrophe theory found a footing. I think he would have been intrigued.

From: PROFESSOR A.D.J. MEEUSE FLS Egmond aan Zee, The Netherlands, August 2005

On the 18th of October 2004 I reached the age of 90. The cerebration (sic) committee that sent the anniversary invitations ordained that The Linnean Society ought to be informed but there was some delay because a curriculum vitae had to be provided and I had to supply it myself.

So: Adriaan Dirk Jacob Meeuse was born on Oct 18th 1914 in Sukabumi (Java) from Dutch parents. Primary school at Sukabumi; Secondary school at Bogor and what was then called Batavia (now Jakarta) and The Hague. He excelled in modern languages (especially English) and Chemistry. In his youth he had been much impressed by tropical nature, and after the whole family had left for The Hague in 1931 (his father had earned a pension), he started to study Biology at the University of Leiden. Within the allotted time he finished the candidaats-examen (comparable to BSc) and doctoral (about equal to MSc) in 1938: subjects Botany, Zoology and 'technical' Botany. In the same year his teacher H.J. Law, under the impression of Adriaan's floristic achievements invited him to accompany him on a study- and collecting trip to S.W. Africa (now Namibia), South Africa, plus Reunion, Mauritius and Madagascar on the outward journey.

After his return he started work on his dissertation interrupted by military service during the mobilisation. In the meantime, through the intercession of Van Herson he was appointed as biologist at the Veselinstituut TNO at Delft and became head of the biological department. He studied flax retting and flax technology, damage in textiles, moth and mould proofing, causes of slime-spots in paper. He had followed a course on textile fibres and one on paper under Van Herson. I forgot to mention that on the outward journey he met his future wife.

Meeuse is not an ivory tower scientist. His assets, incidentally: no stage fright, a natural disposition to learnt languages and an inborn capacity to classify. The late Prof Van Steenis said: "Good systematists are born". He got his Dr phil degree in 1941. The *homo ludens* in Meeuse is obvious from his sketches and the cartoon-like self-mockery in publications and some of his books (he can draw rather nicely).

In 1952 he became Scientific Officer, later Principal SO, at the Botanical Research Institute, Pretoria (South Africa) where he was in charge of the Sympetalae barring the Apocynaceae and Compositae. He monographed several families that are also found in South Africa: Sapotaceae, Convolvulaceae, Cucurbitaceae and Malvaceae (barring Hibiscus).

He contributed to "The Flowering Plants of Africa" and to several floras: Flora Zambesiaca, Fl. of Mosambique, Fl. of South Africa and a bit to the Conspectus of the flora

of South West Africa (now Namibia). He had in his late student days already done several families for the provisional Flora of Java.

In his students days he had become interested in insects (mainly beetles and hoverflies) and Mollusca. He also contributed to several encyclopaedias. His versatile mind made him publish on the bitter cucurbitoxins in connection with the classification of the family on a natural hybrid (which he reproduced) and the relationship between the Aardvark and a wild cucumber with bitter subterranean fruits.

In 1960 he was asked to become an ordinary professor of botany at the University of Amsterdam, effective from 1961. *Qualitate qua* he also became the director of the Hortus Botanicus (and modernised it where necessary) until about 1980 (when it became too much on account of other duties).

During his professorship he was the proposer of seven phil doctorates and two *honoris causa*. His interests became focused on two subjects, primarily phytomorphology (which led to his anthocorm theory) and the evolution of angiosperms which resulted in the publication of four books. Later he became interested in anthecology (floral biology) and, with two of his most intelligent students, some novel forms of pollination (e.g. ambophily and gravitational pollination) were recorded.

He is still active but the subjects are mostly mollusca. He was asked to write an autobiography, including a bibliography of his books (one published by Brill; the cost of printing was partly covered by the small contributions from the persons that attended his farewell lecture, Anatomy of Morphology (1986). His publications (some in press) number about 200.

Meeuse was, and still is, a great collector. He began collecting butterflies when he was 8 years old then, in his student days, other insects, especially beetles and hoverflies, the latter providing useful information for his later anthecological studies. He also became interested in Molluscs collecting them in Western Europe, the Mediterranean, the N.W. United States and Bali. He also collected animals in greenhouses and hothouses in The Netherlands and various European towns (see under his eponyms). During his sojourn in Madagascar he collected about 750 animals, mainly insects but also other invertebrates and reptiles, plua a few birds and mammals.

He collected some 6,000 plant species, most of them with two or several duplicates (so that they are represented in various herbaria). All his other collections (if not *qualitate qua*) he donated to the zoological musea. Eponyms: *Groton meeusei* Leandri, *Hibiscus meeusei* Exell, *Cucumis meeuse*, *Meeusella krassilov* and *bogdonova* (a fossil male organ from Siberia) and *Chaetophiloscia* (now *Burmodiscus*) *meeusei* Holthuis, an isopod (woodlouse). The latter had been collected in the Palm House (Kew Gardens, origin unknown but probably tropics). It was found some 30 years later in Hawaii and a few localities in East Asia.

Hobbies: Chess, bridge, gardening. He once won a minor chess tournament and came once first and once second in bridge tournaments. Meeuse was a gourmet cook and he is also a poet; his unpublished poems in Dutch, English, French or German were said to be good by readers.

Medical Ethnobotany of Australia Past and Present

A Paper read to The Linnean Society, Piccadilly, London,
Thursday 30th September, 2004.

Introduction

Ethnobotany is that close-up and personal interaction between flora and individual men and women and the communities in which they live. It applies to the botanical relationships which define a society, often a microsociety; and which characterise the specific and distinct use of local flora. The specialty encompasses the personal use of and interaction with herbs, shrubs, trees, fungi and ferns. It relates to the use of botanical material as individual items of food, fire, tools and implements, adornment, religious rites, water sentinels, toys, mood-altering drugs and emblems of totemic identity or collegiate fraternity; and, in this context, especially as medicines.

Medical Ethnobotany

Medical ethnobotany is currently practised widely by Aboriginal Australians and is a living profession. In littoral, coastal and inland communities, a sick individual will consult a family member and use local ethnobotanical remedies as the usual and normal method of treating disease symptoms. If these persist, the patient usually then consults a local healer. In the central arid regions of Australia, such healers are called "Nungungi". Their professional knowledge is extensive. In parallel Australian cities of the twenty-first century, some 60 percent of European patients also seek the advice of their local pharmacist as their first professional medical consultation for the alleviation of the symptoms of most ailments.

Much interpersonal discussion with Aboriginal colleagues both in Central Australia and elsewhere and a review of some of the key texts on Australian ethnomedicine, reveals that there are several common themes which characterise Australian ethnobotany. These include (a) the principle of multi-use or "broad-spectrum" use of botanical material in the medicinal context; (b) an extensive local knowledge of the pharmacological properties of leaves, roots, bark, flowers and stems of the entire local florilegium; and (c) a paradigm of symptomatic treatment rather than a unifying disease-specific therapeutic approach. There exists also an extensive use of botanical material as agents of preventive medicine. This latter often fuses the themes of preventive medicine and positive health with those of religious ceremony and ritual.

Broad-spectrum ethnobotany.

One ubiquitous feature of ethnobotany in Australia is the multiple use of a particular species. This applies particularly to eremophilous flora where one species, or even one tree or bush may of necessity be the only living specimen to supply topical salves, internal medicines or tonics – in addition to being a source of food, firewood or ritual adornment. The evolved tradition of non-specific medicinal uses is also probably related to the traditional hunter-gatherer or nomadic lifestyle of men and women of many Aboriginal Language Groups:

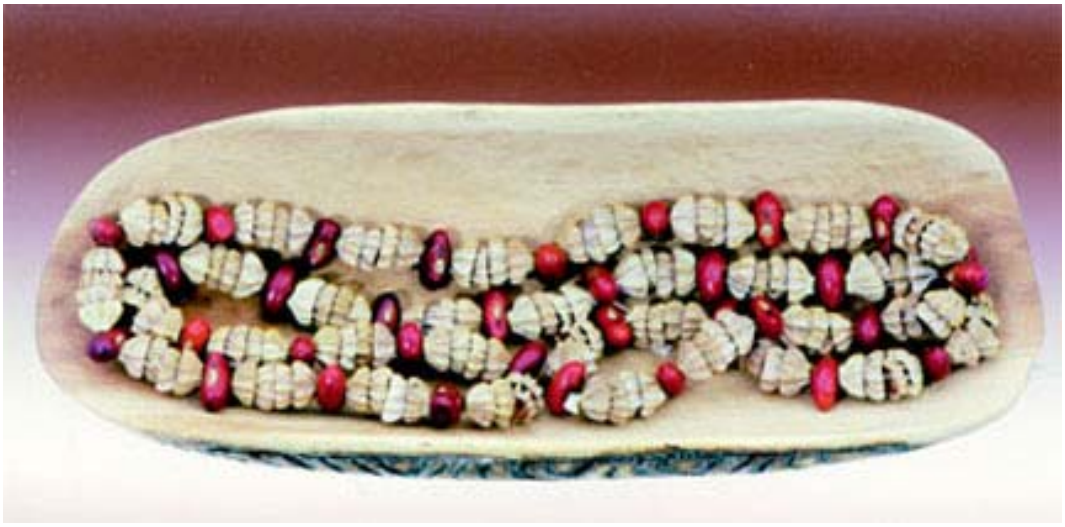

Figure 1. Ethnobotany. A coolamon made from the Red River Gum, *Eucalyptus camaldulensis*; with a decorative necklace composed of alternating sets of "Initi" seeds and the pericarps of the Red Mallee, *Eucalyptus pachyphylla*. *Eucalyptus camaldulensis* provides coolamons, firewood, ash for pituri, toys, hair adornments, necklaces, medicinal infusions and medicinal kino. Aranda Language Group, Alice Springs, June 2004.

> "If one is often on the move it is better to concentrate on a range of plants with a broad-spectrum of uses, for the specific plant you need for a particular ailment may be miles away just when you need it" [1].

Another example of this "broad-spectrum" theme is *Eremophilia duttonii*, the Red Poverty Bush, which yields decoctions and infusions for the treatment of colds and influenza-like infections. It is also used as an antiseptic skin wash. As its common name suggests, it grows in very dry and inhospitable regions. It is particularly valued for its antiseptic properties and in the twenty-first century in some Aboriginal communities it remains in use in preference to proprietary antiseptics. The Agherre Intenthe (Aranda) and Muntjunpa (Pitjantjatjara) Peoples have recorded that "kangaroos are frequently seen breaking down these shrubs [*Eremophilia duttonii*] and rolling amongst the leaves, perhaps to remove ticks".

Universal Medical Ethnobotanical Knowledge

Individual Aboriginal men and women have always possessed a detailed knowledge of the medical properties of local flora. Such personal medical lore, known and understood by all earlier Aboriginal Peoples and today by all those living in Aboriginal Communities, has been at least one order of magnitude greater in extent when compared with the extent of knowledge of western doctors today. Western appreciation of the extent of ethnobotanical pharmaceutical and pharmacological knowledge is a phenomenon only of the later twentieth century – when non-exploitative seeking of such knowledge, in a spirit of humility and reconciliation, began to develop. Such has not always been the case. When William Dampier touched at Shark Bay in Western Australia in 1698, he wrote of the Aboriginal Peoples he saw:

> "… the Earth affords them no good at all. There is neither Herb, Root, Pulse nor any sort of Grain for them to eat, that we saw…".

By contrast, the sharing of the detailed ethnobotanical knowledge of individuals in such accounts as "A Rainforest Pharmacopoeia" [2] by the Yidinyji People of the Cairns hinterland of North Queensland, has revealed the extent of medico-botanical knowledge which is a natural and ubiquitous part of such Communities, to be shared if one takes the time and has the humility to ask about it. Many hundreds of botanical medicines were known, probably to each Yidinyji tribal member; and the specific and often complex details of the preparation of such medicaments, their modes of administration, their dosage, their dangers and their complications, were well understood.

Such extensive knowledge, possessed as a natural part of Tribal and now Community lore by all members, contrasted with the limited pharmacopoeias of the first European doctors in Australia. Dr Walter Scott, surgeon to the convicts and the garrison at the Moreton Bay Settlement, used only 23 drugs in his medical kit during his outpost service from 1824 until 1826. The Aboriginal People of Cape York had specific ethnobotanical remedies for the treatment of spear wounds, snake bite, poisoning, antidotes for stings and bites, toothache, headache, diarrhoea, constipation, influenza, boils and bleeding [2].

All Aboriginal youths living in Communities still with traditional values learn how to prepare medicinal extracts from botanical sources and as "apprentices" of both sexes know how to extract active ingredients. Five methods are used – infusion, decoction, direct mechanical crushing, maceration and emollient preparation (this latter often using emu fat as an excipient or carrier vehicle). These remain the basic processes also of Western procedures to extract pharmacological agents from plant material. Infusion is the steeping of leaves, roots, bark or flowers in hot water; or the pouring of boiling water on the material and letting the preparation cool. We extract the desirable drugs from tea and coffee by identical infusion techniques. The temperature does not rise above 100° C. and there is no vigorous mechanical agitation.

A more vigorous process is the short-term boiling of plant material, again with water. This process of decoction mechanically breaks down fibres, splits complex carbohydrates and bursts cell walls. Bark and root extracts are almost always prepared in this way. A different cocktail of pharmacological agents is liberated by the decoction process, when compared with extraction using lower-temperature, gentler infusion. In pre-European hunter-gatherer times, the boiling process was achieved by placing red-hot stones from the fireplace in rock-platform holes, filled with water. Today, empty tin cans or billies are used.

Maceration is the gentlest process and is the technique of prolonged steeping of the botanical material in cold water. Here the low temperature does not destroy delicate fragrances or complex organic molecules. Whatever the primary method of extraction, the use of animal fat as an excipient and emollient-carrier for such extracts has widespread use. An example is the method of application of roasted and powdered bark of *Hakea eyreana* to burns. After cooling, the powder is mixed with emu or kangaroo fat and the emollient with its pharmacological agents is then smeared as a dressing on the burnt tissues, usually skin. The application is repeated daily. In some Communities (Aranda and Pitjantjatjara) this remedy is used routinely today to treat burns in preference to the application of commercially available antiseptic topical dressings. All the pharmacologically-active agents prepared by infusion, decoction or maceration are, of necessity, water-soluble. Alcoholic extracts of plant materials,

tinctures, have never been part of Aboriginal ethnobotany.

Relatively few extracts of medicinal plants are taken internally. Aboriginal Peoples have always retained an extensive and detailed knowledge of botanical toxicology. The ratio of a substance's minimum toxic dose to its effective medicinal dose is called the Therapeutic Index in modern European pharmacology. This theme – the poisonous properties of a plant being dose-dependent – is well understood in medicinal ethnobotany, by practical application. Local lore guides the safe exploitation of such toxic species, with low-dosage use. Some plants, such as *Isotoma petraea*, the Rock Isotome found in the lands of the Yankunytjatjara People, is so potent that "the effect of the plant is too strong to allow its use by children" [3].

Relatively few plants or their extracts are taken internally as medicine. The Native Lemon Grass or Scented Oil Grass, *Cymbopogon ambiguus*, is one of the few central Australian medicinal plants whose infusions are swallowed. Almost all decoctions, infusions and maceration extracts are prepared fresh each day. Again, the Native Lemon Grass is one of the few which are dried and kept for repeated use, when on the march.

Symptomatic Therapy

There exist very few first person accounts of Aboriginal medicine. Most reports have been published by European doctors or anthropologists, many driven to try and preserve in secure form the vast oral traditions of medicine embedded in more than 600 Language Groups, many now lost forever. Almost all the written ethnobotanical records relating to medicine have concentrated on therapy. There are virtually no primary records of diseases themselves or their pathogenesis or any classifications or groupings of disease. One exception was a personal study by the author, of Lardil and Kaiadilt (Gulf or Carpentaria) understanding of the pathogenesis of congenital malformations. Language-specific medical lexicons, as a basis of written texts on pathology, as European medicine would use this latter term, are rudimentary.

The consequence of this is that most Indigenous and Western records (both) refer to symptomatic rather than causal disease-based therapy. In the Western paradigm of medicine, there has evolved a six-stage progression which leads to therapy – History taking, examination, differential diagnosis, tests and investigations, definitive diagnosis and then treatment. Ancient Egyptian, Sanskrit and ancient Oriental medicine had developed to the point of a four-stage paradigm of history, examination, diagnosis (often a symptom complex) and treatment. It was not until the progressive work of Morgagni (1682–1771) in Padua, Bichat (1771–1802) in Paris, Virchow (1821–1902) at Berlin and later Sir William Osler (1849–1919) that the concept of differential diagnosis evolved. The term "differential diagnosis" was first used by French in 1913. White cell counts as a basic test for infection and as a discriminator of the various causes of infection – viral, bacterial, parasitic – were not introduced into Western medicine until 1904.

The paradigm of Aboriginal medicine almost certainly did not evolve to parallel that of the European concept of differential diagnosis as a key step in medical management. The former has remained basically that of the treatment of symptom complexes. However, this interpretation may simply be one of ignorance on the part of Western observers, including the author. Much remains to be documented, urgently, in this area.

Figure 2. Ethnobotany. “Bush Coconuts”, sometimes called “Bloodwood Apples” ¾ an insect gall on a Desert Bloodwood (*Eucalyptus opaca*) tree. The larva (grub) taken from the central cavity is bathed in a clear nutritious fluid and the gall is lined by a white edible “flesh”. The Desert Bloodwood is a favourite home of native (stingless) bees, *Trigona* sp. whose honey (“sugarbag”) is the most sought after delicacy in central Australia. Medicinal kino which extrudes from wounds on the trunk of the Desert Bloodwood is used extensively as a salve; and an infusion is also drunk as a gargle for sore throats. The wood from this tree is one of the most favoured of all firewoods; and the fruit capsules and leaves are used as hair decorations, necklaces, toys and as personal adornment during ceremonies. Specimen collected by the author, near Alice Springs, June 2004.

Some extracts or the raw plant material itself may be applied directly to skin or mucosal lesions. Plant steroids, essential oils, higher alcohols (waxes), terpenes and tannins, being mostly water insoluable, are thus absorbed in this form of therapy. The astringent sap from Euphorbiaceae and Asclepiadaceae (e.g. *Sarcostemma viminalae australae* (the Caustic Vine) may be used to treat viral warts by direct application [4]. The sharp phyllodes of *Acacia tetragonophylla* (“Dead Finish”) are used to pierce warts. Botanists working in the Aputula Community of Central Australia have documented that:

> “A number of [*Acacia tetragonophylla*] phyllodes may be inserted into the wart, the main part then being broken off to leave the apices embedded in the wart. After four or five days the wart has shrivelled and may be removed easily” [5].

Fungal infections of the skin are common and are treated either by a one-stage or two-stage process. In this latter, affected areas are first debrided by rubbing firmly with the abrasive leaves of such trees as *Ficus opposita* (the Sandpaper Fig) until blood is drawn. Then the immature fruits of *Passiflora foetida* (Wild Passionfruit) are crushed and mixed with a little pulp from a ripe fruit. The mixture is then rubbed onto the debrided areas and allowed to dry *in situ* for a day or so before being rubbed off. *Passiflora foetida* extracts are

extensively used in other countries, including South America. This species contains both harmane alkaloids and flavonoids.

The crushed pseudobulbs of epiphytic orchids are also used in similar fashion, especially in coastal and rainforest communities. *Dendrobium affine* is one such example. The juice of some species of *Dendrobium* has mild antibacterial effects and the viscous extrusion of the crushed orchid pseudobulbs is sometimes used for minor burns. The decoctions of the bark of the Propellor Tree or Stinkwood (*Gyrocarpus americanus*) are also used in this way, this same species also being used in similar fashion in Fiji.

Symptomatic therapy is most widely used to treat the symptom complex of rhinorrhea, conjunctivitis, respiratory congestion and sore throat. Such constitutes the common cold, or influenza, or a myriad of other viral respiratory tract infections. Almost all such illnesses are self-limiting and an extensive and sophisticated Aboriginal pharmacopoeia exists to treat their symptoms.

Such include decoctions of the grasses *Triodia microstachya* (Spinifex), and that prepared from Swamp Grass (*Themeda avenacea*). Similar "all purpose" symptomatic decoctions are made from *Eucalyptus pruinosa, Streptoglossa odora, Streptoglossa bubakii* and *Santalum* spp., the Wild Peaches and Wild Plum). A macerated liquor of *Tamarindus indica* (the Tamarind) is also used extensively in this way.

Preventive Medicine

There exists today a rich culture of preventive ethnobotanical medicine among traditional Aboriginal Communities. There are at least two themes in this "specialty". The first relates to the use of plant materials as deterrents against insect and mite infestation. An example is the use of extracts of the fly-repellent eremophilous shrub, *Streptoglossa bubakii*. The leaves of this shrub contain high concentrations (10-15 percent of dry weight) of essential oils such as caryophyllene and gamma-elemene.

Some bark decoctions are used both to treat and prevent scabies infestation by the itchmite, *Sarcoptes scabiei*. One example is the extract made from the Native Bauhinia (*Lysiphyllum cunninghamii*). Another is the decoction prepared from the leaves of the Weeping Emu Bush (*Eremophila longifolia*), this latter containing a concentrated cocktail of essential oils including alpha-pinene, limonene and terpenes.

A second theme within "botanical" preventive medicine is that relating to the "smoking" of infants. Western anthropologists refer to this widespread but poorly-understood (by European observers) practice as "smoke therapy". The smoking of infants has deep ritual significance and is still widely used. Aboriginal Peoples in many communities today believe that the smoking of infants has important pro-active protective medical overtones. There is a fundamental and deeply held implication also that the smoking rituals will have long-term effects and make babies strong and placid [6]. The smoking of infants is undertaken by mothers and grandmothers, often as an unhurried and enjoyable practical ceremony conducted within the fellowship of a small women's kinship group.

A fire-pit is dug, a fire lit and hot coals prepared. Pieces of resinous termite mound are added to the hot coals. The resinous material which is used for infant-smoking is specific

for different communities. In some communities of the Ngarinyman and in those of the Warlpiri, termite mounds are found particularly amongst clumps of the Spinifex Grass, *Triodia pungens*. Leafy green branches are then placed on top of the glowing coals in the fire-pit. When there is a continuous flow of smoke, and in the absence of any flame, the baby is held lovingly above the leaves, and is invested by the smoke. The smoking continues until the fire-base cools.

In the smoking of babies, leaves from any one of several species are used by communities in central Australia. These include: *Acacia aneura, Acacia lysiphloia, Eulalia aurea, Exocarpos latifolius,* and *Dodonaea viscosa*. It is interesting that these five species contain little or no essential oils, but generally contain triterpenes and higher than average concentrations of tannins (6 percent of dry weight in the case of *Exocarpos*) and saponins.

Babies are often smoked soon after birth, and at least one report suggests that this leads to accelerated desiccation of the umbilical cord. A report from the Lajamann Community in the central regions of the Northern Territory, describes this practice:

> "Newborn and young babies are held over the smoke for a few minutes. Soon after the delivery, mothers sit or lie over the pit in the smoke. Carried out daily for about a week, this treatment is beneficial to mother and child; it helps stop bleeding and shrivels baby's umbilical cord" [7].

Figure 3. Ethnobotany. "Bush Tomatoes", the fruit of *Solanum centrale*. This is a small desert bush with silver leaves and purple flowers and grows in the extreme eremophilous regions of the Simpson Desert. These fruits are sometimes also called "Desert Raisins"; and are called "Akatyerre" by the East Arrernte People and "Yakajarri" by the Walpiri People. This species is regarded as "probably the most important Central Australian plant food". Some nine species within the genus *Solanum* are used extensively as foods, many having a high vitamin C content. *Solanum* leaves are sometimes used as a substitute for *Nicotiana* and one species has a reputation (Pitjantjatjara) as a contraceptive. Specimens provided by the Alyawarra Community, east of Alice Springs, June 2004, with acknowledgements.

Conclusion.

After 5000 years of recorded history, and despite the advance of modern Western medicine, some 70 percent of the world's contemporary populations still rely on traditional herbal remedies. One in every four Western proprietary medicines owes its origin to a medicinal plant.

When European and French explorers first botanised extensively in the Australian coastal regions, from the early nineteenth century, they encountered an Australian florilegium almost all of whose species were new to Western science. It was anticipated that many new medicinal herbs, trees and grasses would be added to the Western pharmacopoeia. Such has proved not to be the case. At the most, five species have been exploited by Western medicine. *Eucalyptus* gum, kino, was one of the first two exports from Australian waters - whale oil was the other. Used extensively by Aboriginal forbears, and still used today, kino has many uses. *Eucalyptus* oil is highly toxic and commercial concentrates are highly toxic if accidentally ingested by children. *Eucalyptus* oil retains a minor medicinal use in Western proprietary medicines, primarily for its aroma.

Acacia gum and seeds are extensively used by Aboriginal Australians today. More than 30 species of *Acacia* are used as "bush tucker" or for medicinal uses. Western medicine also has used *Acacia* gum and extracts from it. *Acacia* preparations remained in hospital pharmacopoeias in Australia until the 1950s. Mucilaginous extracts and *Acacia* seeds are used in commercial confectionary and in gourmet biscuits today, but such constitute only a small niche market. By contrast, *Macadamia* nuts, brought to the notice of western science in 1858 by Ferdinand von Mueller, comprise an extensive and expanding international horticultural industry. *Macadamia* oil has a very minor quasi-medicinal use as an emollient and is also promoted as a cooking oil with desirable health properties.

Only two Australian genera are used commercially in Western medicine today. One is *Melaleuca* from which is extracted Tea Tree Oil. This latter has significant antiseptic properties, but is not completely effective against some gram-negative bacteria. The most important commercial species used today, in the context of medical botany is *Duboisia myoporoides*, the Corkwood, which for millennia has been used by the Aboriginal Peoples as a mood-altering and endurance drug. The word, "pituri" is used in the twenty-first century by Aboriginal Peoples to mean any one of several mood-altering substances of botanical origin, including Wild Tobacco (*Nicotiana* sp.) and *Duboisia*. *Duboisia myoporoides* contains a powerful cocktail of atropine-like drugs including the tropane alkaloids hyoscine (scopolamine) and hyoscyamine. Selective horticultural breeding has now produced *D. myoporoides* strains and hybrids with alkaloid content of the harvested leaves now exceeding 8 percent dry weight. One tiny spec of a dried leaf in the eye will result in a dilated pupil with effects lasting for a week or more. The majority of the world's supply of hyoscine (used as pre-medication prior to anaesthesia) and of hyoscyamine (used as an anti-motion sickness tablet or skin-patch) now comes from the South East Queensland – New South Wales region. These two current commercial medicinal species, *Melaleuca* and *Duboisia*, form an ethnobotanical bridge across two cultures. Their continued use by Aboriginal Peoples and by patients throughout the world encompasses a wider bridge, one which extends across many millennia.

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Winged nymphs and Rafinesque's tomb

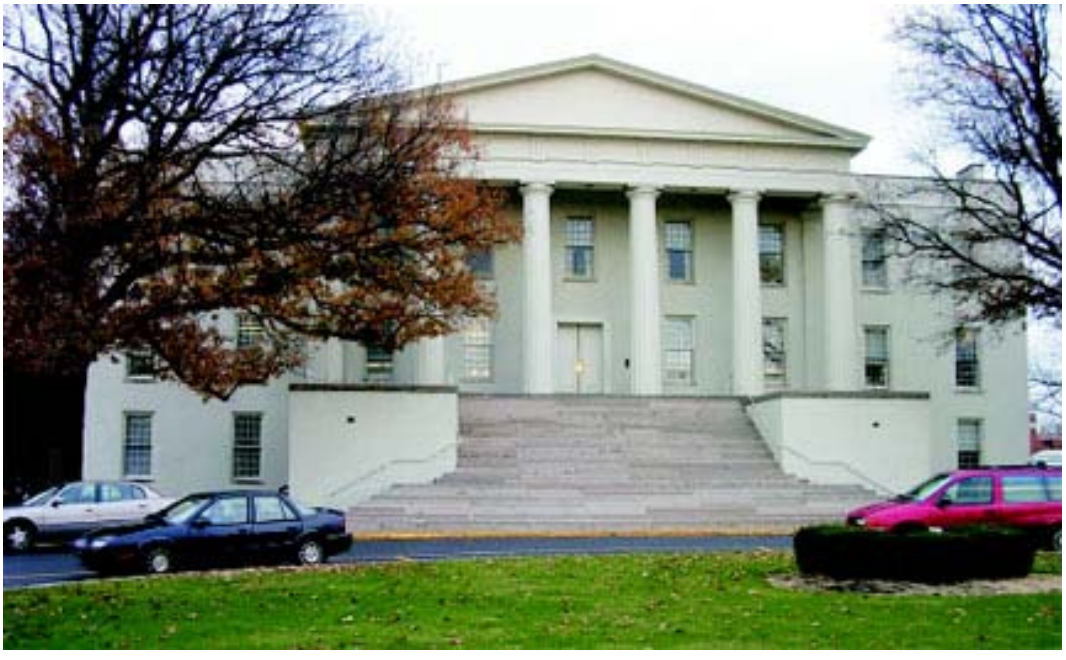
Constantine Samuel Rafinesque (1783–1840) is best known as a botanist, but his prodigious output of many hundreds of published notes and works (Fitzpatrick, 1911; Boewe, 1982) touched many areas of biology, including butterfly taxonomy. Until recently, however, it was thought that all of the names that he had introduced for butterflies were invalid. Phillip Ackery (1975: 90) did briefly employ *Parnalius* Rafinesque, 1815, for the papilionid species previously placed under the preoccupied generic name *Thais* Fabricius, 1807, but a decision by ICZN (1979) in favour of the junior name *Zerynthia* Ochsenheimer, 1816, not only put paid to *Parnalius* but, so it seemed at the time, to all butterfly names coined by Rafinesque (cf. Cowan, 1970: 11).

About five years ago it became apparent that the family name Nymphalidae, officially attributed by ICZN (1958) to Swainson, 1827, is junior to both the Hipparchiidae Swainson and Heliconiidae Swainson, names also applicable to the family Nymphalidae as currently conceived. Moreover, Swainson's Nymphalidae is clearly based on a junior homonym (*Nymphalis* Latreille, 1804) with a different type species to that of the senior homonym (*Nymphalis* Kluk, 1780). Fortunately, largely due to the work of Jonathan P. Pelham (in litt., 2002), this unwelcome threat to stability has been averted. As first noted by Cowan (1970), a family group name based on *Nymphalis* was proposed by Rafinesque (1815), well before any of Swainson's names, and Pelham's attribution of the Nymphalidae to Rafinesque has now been adopted (e.g. Vane-Wright & de Jong, 2003: 167). Thus the name of Rafinesque lives on in the butterflies after all, as the authority for this major family. But who was Rafinesque?

As now extensively documented by, among others, Brown (1942), Boewe (1957, 1992, 2003, 2004), Gobar & Hamon (1982), and Warren (2004), Rafinesque was one of the most controversial characters in the history of systematic biology. Brilliant, eccentric, quixotic, often careless and perhaps derivative and vain, he left a mixed legacy. Born in Constantinople of French and German parents, he grew up in France and Italy, and first visited America in 1802. From 1805 he lived in Sicily but, leaving behind two sons and their mother who, for religious reasons, he was unable to marry, he quit Europe again for the USA in 1815, never to return.

In 1819, through the intervention of his friend the entrepreneur John D. Clifford, Rafinesque was appointed Professor of Botany and Natural History at Transylvania University, in Lexington, Kentucky. Transylvania, today a relatively small liberal arts college, still flourishes on a campus close to its original site in downtown Lexington. Founded in 1780, it holds the distinction of being the oldest American university founded west of the Appalachian mountains (Jennings, 1955; Wright, 1975).

After a bright start, Rafinesque's tenure was dogged by difficulties and growing animosity. He was a great fieldworker, but teaching 'natural philosophy' based on the examination of real specimens was a practice not well understood or received by his peers. Five years after Clifford's untimely death in 1820, Rafinesque was humiliated by the university's president, Horace Holley. According to his own account, on returning from a long trip to Washington he found one of his two University rooms in use by a student, while all his specimens, books



Rafinesque's tomb, which dates from 1924, is located under the left podium of the steps of the Old Morrison Building, Transylvania University, Lexington, Kentucky. This fine building was completed in 1833 and, although the interior was largely destroyed by fire in 1969, the tomb was not significantly damaged. The covering slab was made in Philadelphia after Rafinesque's original burial place was rediscovered by Henry C. Mercer, and transported to Lexington along with what were thought to be the great naturalist's mortal remains. The inscription reads: Honor to whom honor is due / Constantine S. Rafinesque / Born, Constantinople, 1783 / Died, Philadelphia, September 18, 1840 / To do good to mankind has / ever been an ungrateful task / The works of God to study / and explain / is happy toil and not to / live in vain / This tablet placed here / September, 1919.

and effects had been "thrown … in a heap in the other" (Dupre, 1945). Rafinesque left Lexington in early 1826, and never came back. According to legend, in departing Rafinesque placed a curse on the University. Holley died soon afterwards from yellow fever and the University's impressive main building, on the original Gratz Park site, was totally destroyed by fire.

Rafinesque lived out the rest of his days in Philadelphia, in impoverished conditions. Even so, by trading in specimens, lecturing, patronage, and even by creating a bank for workmen, he managed to continue publishing. This included some of his most significant work – as well as some of his most controversial. In the latter category falls the *Walam Olum*, a supposed translation of a vision of creation written on wooden tablets that Rafinesque claimed originated with the Delaware Indians; most scholars now consider the whole affair to have been an elaborate and complex hoax (Oestreicher, 1994, 2002). On the other hand, in the *New Flora of North America*, Rafinesque (1836) put forward the idea that many species have evolved from varieties, a suggestion referred to by Darwin in later editions of the *Origin*. Rafinesque's (1828–1830) *Medical Flora* is also highly regarded.

On his death in 1840, Rafinesque was buried in a pauper's grave. In 1919 his burial place in Ronaldson's cemetery, Philadelphia, was rediscovered by a local scientist. News of this, and the fact that the cemetery was to be redeveloped as a playing field, reached Lexington. In 1924 Transylvania honoured their former Professor of Botany and Natural History by creating a tomb within Morrison Hall, the administration building of the University, to receive his bones. Perhaps the curse lingers on; maybe Rafinesque had the last laugh. The bones now enshrined are most probably those of a penniless woman originally buried in the same grave, and not those of Rafinesque at all (Boewe, 1987). This curious monument nonetheless serves to remind us of an extraordinary man, and the capricious nature of celebrity. But it is also good that Rafinesque's name lives on, not only for botanists in their struggle with the huge number of plant names that he introduced, but also for lepidopterists, as the authority for the great family of winged nymphs.

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I am very grateful to my sister Anne Binford and her husband Professor Joseph Binford, Transylvania University, for much help and information. During a brief visit to Lexington in November 2004, Sarah Emmons, Transylvania's Director of Public Relations, kindly gave me access to the tomb and permission to take the accompanying photographs. B.J. Gooch, Special Collections Librarian, most generously put at my disposal a wide range of books and other reference materials, and provided much helpful advice.

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Book Review

M. Mantelow & Ingvar Svanberg (ed.): Växter i Linnés landskap. Linné's historiska landskap 1 (2004), 148 pp. Price: unknown.

This is the first book in a series with the intended to describe the flora in Swedish landscapes as they appeared to Linnaeus. Since the Linnean tercentenary is approaching this seems a very good idea. However, it is not a good idea to start the series with a volume also celebrating a present-day biologist, Børge Petterson, on the occasion of his 60th birthday. Although he has also worked in these landscapes and in the Linnaean spirit, he was never actually part of the Linnaean landscape. One article is of course devoted to him. The nine other articles at least have their origins in Linnaean subjects, but strictly speaking it is only the first one, written by the editors, which is devoted to the landscape and flora that Linnaeus experienced – the one around Uppsala. Svanberg, in another article, also wanders the streets of Uppsala searching for Good King Henry (*Chenopodium bonus-henricus*), but he also wanders far from the Linnaean starting point. Most of the contributions are about what Linnaeus was growing (coffee, myrtle, rhubarb and deadly nightshade), which sometimes he certainly observed daily – but not in the landscape! I have particularly enjoyed Roger Englund's contribution on the Linnaean rhubarb-hunt, as well as Manktelow's on the deadly nightshade *(Scopolia carniolica)* which gives close insights into how Linnaeus worked. In a class of its own is the article by Professor Rydén on Linnaean orchid names, particularly the Swedish ones which are treated according to their theme-groups, and recording from where they originate and were first recorded – a very fine scholarly treatment. The articles are all in Swedish, but there is one short summary in English.

All contributions are worth reading, though they give different glimpses of the 'Linnaean universe' rather than his landscape. They do not, however, make a united collection, since the subjects are too scattered, only partly reflecting the main title of the series. I am looking forward to the next volume in the hope that the editors will be more faithful to Linnaeus' landscapes.

PER M. JØRGENSEN

The Linnean Society
Programme

2005

15th Oct.		CONVERSAZIONE at Chester Zoo hosted by The President
26th Oct.	all day	NEW DISCOVERIES IN OLD COLLECTIONS Linnean Society Palaeobotany Group † Jason Hilton FLS
14th Nov.	all day	CELL DEATH AND THE PROTOZOAN PARASITE British Society for Parasitology one-day symposium † Sue Welburn
17th Nov.	*6pm	THE ORIGIN OF MODERN HUMANS Chris Stringer FLS FRS
2nd Dec.	11am	The Brogdale Lecture GERMPLASM COLLECTIONS: LINKING THE PAST, PRESENT AND FUTURE Rick Walden Cox, East Malling Research Centre
5th Dec.	6pm	Debate: PHYLO CODE vs LINNEAN CODE † Quentin Wheeler FLS
8 Dec.	5.30pm	The Hooker Lecture ROBERT WRIGHT AND THE ILLUSTRATION OF INDIAN BOTANY Henry Noltie FLS Followed by Christmas Social

2006

19th Jan.	*6pm	THE KNIFE MAN: John Hunter, father of modern surgery Wendy Moore
16th Feb.	6pm	Launch of the ECHINODERM SYNOPSIS Eve Southward and Andrew Campbell

† organiser * Election of new Fellows

Unless stated otherwise, all meetings are held in the Society's Rooms. Evening meetings start at 6 pm 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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