

THE LINNEAN SOCIETY OF LONDON

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THE LINNEAN

Newsletter and Proceedings of the Linnean Society of London

Edited by B. G. Gardiner

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Editorial

As mentioned in the previous editorial, 1992 is the centenary of the death of Richard Owen. Unfortunately we failed to announce that the Society for the History of Natural History has chosen to devote its 8th International Conference to exploring some of the aspects of Owen's life and work. This is being held in London on 29 April–1 May (see under Other Meetings). Also later this year, in early April, the Natural History Museum will be opening a completely new exhibition devoted entirely to dinosaurs.

The illustration below depicts Owen's three fearfully great lizards which together constituted his Dinosauria. The original sketch was made by Owen for Benjamin Waterhouse Hawkins to illustrate the relative sizes of the three monsters; *Megalosaurus* is in the middle, *Iguanodon* to the left and *Hylaeosaurus* to the right. Surprisingly, though *Hylaeosaurus* was first described in 1833 (see *The Linnean*, 6 (3): 22) apart from Owen's brilliant reconstruction it has scarcely been examined since (probably because it is mostly preserved in a block of matrix some 4' x 3' x 2' which needs preparing in acid).



"The strangest of the old monsters which it has pleased God to blot out of his creation" (Owen, 1844).

Elsewhere in the issue your attention is drawn to Biodiversity Conservation Strategy programmes and to Earthwatch Europe.

Society News

When we're sixty-four?

On 7 October 1991, former Presidents, Council, the Editorial Committee and past Editors of the Society's books and journals marked 25 years of publishing with Academic Press. On hand at the champagne reception were Mr Peter Jovanovich, Chairman of Harcourt Brace Jovanovich, owners of Academic Press, Mr Brian Knez, of General Cinema, the new owners of HBJ, Miss Joan

Fujimoto, Managing Director of Academic Press, her predecessor, Mr Charles Hutt, a former Treasurer of the Society and colleagues from the Press and Whitefriars, the printers. Academic Press presented the Society with a facsimile copy (one of only 350) of a volume of Leonardo's scientific drawings, the originals of which are in the Royal Collection at Windsor. The link with Academic Press has made a very considerable difference to the fortunes of the Society, whilst the tireless efforts of the Society's Editors have given the Society a cachet which other Societies envy, a fact alluded to by Mr Jovanovich as a useful commercial advantage to HBJ itself. Clearly this is an excellent example of symbiosis—long may it continue. Even those unable to attend the splendid occasion wrote wishing the venture well in the future. Nobody would disagree with that.

Eastern Europe

The Society is aiming to set up a fund for the purpose of purchasing books for universities in Eastern Europe. The Society has written to a number of such institutions, inviting them to specify their needs in biological subjects. To date, two universities, Charles University in Prague and the University of Novi Sad in Yugoslavia, have sent short lists of their book requirements. The amount to purchase these books is £300–400. The Society would like to invite members to contribute to this Fund for books for Eastern European universities. Cheques should be made payable to The Linnean Society of London quoting Eastern European Book Fund. A flier listing the books required was sent with the January issue.

Schools

Help is required for school biology, which is the seed corn for the hundred or so biological societies in the UK. We all welcome the necessity for all schools to teach science to all their pupils under the National Curriculum, but schools do lack basic facilities, like ponds, greenhouses, microscopes (more especially money for their maintenance) and many teachers need training in biology, for example, in fieldwork. As one distinguished biologist put it: "schools must move on from nature study to science". The Programmes Committee is anxious to support the ideas and efforts of Mrs Virginia Purchon, F.L.S., preferably in association with other biological societies. Positive help would be most welcome. The chemists and physicists already do a lot in this direction (the chemists recently launched an appeal for the purpose). In biology, the plethora of societies representing the estimated 75 000 U.K. biologists is a stumbling block to concerted and very necessary action.

Visitors

Visitors continue to stream through the doors of the Society's rooms. Two who spring to mind arrived on the same day, both from the U.S.A. Dr Michael Mueller combines his duties at Harvard with visiting all the places mentioned in the Sherlock Holmes stories, and had just returned from a visit to the Andaman Islands, where the penal colony mentioned in 'The Sign of Four' is still in existence, though lacking inhabitants. There is some feeling that the Indian Government may demolish it, surely an act of unwarranted vandalism. Did your Executive Secretary know the way to a pub called 'The Sherlock

Holmes'? In that department the Society is well informed, but did you know that the pub sells deerstalker hats? A pleasant evening was had, with all being photographed in the aforementioned headgear.

The other visitor, Dr George Pettit, is the Director of the Arizona State University Cancer Research Institute, which has a world reputation in the study of anti-cancer agents, many of them derived from plants and marine organisms. He had just returned from a 'fishing trip' to Borneo, seeking potentially useful marine life to extend his studies, which have included involvement in the exploitation of the bark of the Pacific yew, *Taxus brevifolia*, which yields a compound, taxol, valuable in the treatment of ovarian cancer (see *Scientific American*, October 1991, pp. 97–98). He noted that many plants and marine organisms do not seem to suffer from cancer, a fact that he puts down to their long evolutionary history, which may have allowed them to perfect their defences against this disease and, indeed, many others. Dolastatins, from the sea hare, *Dolabella auricularia*, are amongst the most powerful immunostimulants known and show promise in the immunotherapy of cancers, such as melanoma.

Sadly, Dr Pettit reported the damage being done to coral reefs, the source of many potentially useful organisms, by fishing with explosives. I recall my father being taken on a fishing trip to Eire, where locals tossed a few sticks of gelignite into the river, then netted off the shoals of stunned fish, mainly salmon, on the river surface. Apparently the method has caught on in the Indian Ocean where a mixture of diesel oil and ammonium nitrate is used. Many coral reefs are virtually lifeless as a result. Perhaps those using this method should be introduced to timbo (*Paullinia pinnata*), a plant containing a fish poison, mentioned by H. W. Bates in his 'The Naturalist on the River Amazons', and used for fishing on the Tapajos. Another ticklish problem concerns the yew tree, which is not common and grows only slowly. Should it yield a potent anti-cancer drug, it may very well find itself extinct in the race to exploit its chemistry. Fortunately, it seems that plant tissue cultures do secrete the compound, so the yew tree may yet be spared.

These are just a couple of wrinkles in the game of trying to conserve biological diversity, of which more appears in these pages. Further problems are likely to arise over the ownership of species which show promise medicinally, or in other economically useful ways. There might be merit in noting formally where species have been collected, and in the setting up of a fund to which those who have made use of exogenous species would contribute, and from which contributions could be made to the conservation of biological diversity. Taxonomists are no longer welcome in an increasing number of countries. The exploitation of biological wealth could yet become a major bargaining chip in the world economy. Meantime, it is just possible that there may be no taxonomists around anyway if the gloomy prognostications of one Fellow, writing in the *New Scientist* (24 August 1991), come true. Dr Barry Thomas, F.L.S., suggests, on the basis of the disappearance of jobs in taxonomy over the past two decades, that taxonomists should add themselves to the endangered species list. There is a certain symmetry in this. Without taxonomists there will be no need to lose too much sleep about vanishing wildlife. There will be nobody around to blow the whistle.

Members will be sad to learn of the death in November 1991 of Adrian Grenfell, F.L.S. Adrian's keen interest in the natural history of the West Country

was allied with his work as the printer responsible for our Programmes Card, List, Bye-Laws and various other documents for the Society.

The Officers elected in May exceptionally consisted of four botanists and one zoologist. Council agreed at its September meeting that Dr K. A. Joysey, Vice-President, should join the Officers' Group until the next Anniversary Meeting.

Membership

The Society welcomes those members who were elected in 1991.

On 17th January:

Fellows

Allan Scott Akers
Jean-Marc Anga Abo
John Mowbray Baxter, B.Sc., Ph.D.
Norlyn Lee Bodkin, A.B., M.S.,
Ph.D.
Richard Lovell Feil, B.Sc., Ph.D.
Louis Joseph Guillette Jr., B.Sc.,
M.A., Ph.D.
Stephen Paul Harrison, B.Sc., Ph.D.
Rupert Charles Honnor, B.Sc.,
Ph.D.
Brian G. Irving, B.A., M.Sc.
Thomas Stainforth Kemp
Anne Laurine Larsen, B.A., M.A.
David Conway Lees, B.Sc., M.Sc.,
F.R.E.S.
Lavinia Leormont
Charles Lyte

Derek Henry Mills, B.Sc., M.Sc.,
Ph.D., F.I.F.M.
Dr Ire. Pierre Rasmont
Magli Romera Sa, B.Sc., M.Sc.
David Mervyn John Spratt, B.Sc.,
F.I.M.S.
John Stanley Ryan, C.Chem.,
M.R.S.C.
Mohammed Amin Siddiqi, M.A.,
B.Sc.
Elizabeth Ann Smail, F.S.B.A.
Peter Van Kijk
James W. White, M.G.D.S., L.D.S.,
R.C.S.
M. John Whitehead, Dip.Hort.,
R.F.S.
Richard Adrian Wilding, B.A.
Umikslom Yusuf

Associates

Simon John Forster, B.Sc.

Alex David Rogers, B.Sc.

Student Associates

Paul Michael Barrett

Duncan Koon Kit Wong

On 24 May 1991:

Fellows

Than Than Aye, M.Sc., Ph.D.
Valerie Bains
Kenneth William Barker, I.Eng.,
HNC

Dr Wilhelm Barthlott
G. A. C. Bell, M.A., D.Phil.
Alberto Burquez-Montijo, B.Sc.,
M.Sc., Ph.D.

John Philip Butler
 Peter Frank Sedgely Cartwright,
 M.Sc., Ph.D., C.Chem., F.R.S.C.
 Abdulaziz M. El-Buni, M.A., Ph.D.
 Abdusalam Abdallah M. El-Taife
 Carl G. Edelstam, Ph.D.
 Garth Nicholas Foster, Ph.D.,
 M.I.Biol. C.Biol.
 Javier Francisco-Ortega
 Paul Goetghebeur
 Asha Gupta, M.Sc., Ph.D., F.P.S.
 Paul Wayne Hattersley, B.Sc., M.Sc.,
 Ph.D.
 Inga Maria Margareta Hedberg,
 Ph.D.
 Terry Albert John Hedderson, B.Sc.,
 M.Sc.
 Simon John Hiscock, B.A.
 Robert Elwyn Howells, B.Sc., C.Biol.,
 F.I.Biol.
 Ronald Hugh Kemp, M.A.
 James MacEwan
 Makoto Manabe, BEd., MEd., M.Sc.
 Karol Marhold
 Susan Anne Minter, M.A., M.Hort.
 Barnabas Israel Mpfi

David Jeune Nicolle. DIP.Ad.Ed.
 Prof. Mohammed Nizamuddin, Ph.D.
 Sanitago Ortiz Nunez
 Mikinori Ogisu
 Dr P. Oosterbroek
 Juan Rodriguez Oubina
 Soult Patricia
 Mohammad Atiqur Rahman, B.Sc.,
 M.Sc.
 Javier Guitian Rivera
 Louis Philipe Ronse Decraene
 Nathan Sammy, B.Sc.
 Martin Nicolas Sandford, B.Sc.
 Peter Erich Schmiediche, M.Sc.,
 Ph.D.
 Neil Parker Schultes, Ph.D. (from
 Associate)
 Assoc. Prof. Abdurrazag S. Sherif,
 B.Sc., M.S., Ph.D.
 Prof. Nigel John Harwood Smith
 Robin Thompson, B.Sc., Ph.D.
 Piers Trehane
 Annette Walker
 Muriel H. Walker, B.Sc., Ph.D.
 Peter William Wilkins
 Peter Wood, B.Ed., Cert.Ed., M.Sc.

Associates

Louise Patricia Creighton
 Andrew John Finnegan

Christina Glyn-Woods
 Carole Jane Martin

On 17 October 1991

Fellows

Martin John Attrill, Ph.D., B.Sc.
 Donald Bundy, H.N.D., B.Sc., Ph.D.
 R. C. J. Carling, B.Sc., M.Sc., Ph.D.
 Tapas Chakrabarty, M.Sc., Ph.D.
 The Reverend Nigel Scott Cooper,
 M.A., P.G.C.E., C.Biol., M.I.Biol.
 Robin Gordon Crump, B.A., Ph.D.
 Cornel Owen Dudley, B.A., M.Sc.,
 Ph.D., F.R.E.S.
 Mohan Gangopadhyay, M.Sc., Ph.D.
 Ian David Gauld, Ph.D., M.I.Biol.
 Van Haggerty
 Robert Lee Hammond, B.Sc.
 Jeanne Holgate

Ahmed Jalaludin Kuthubutheen,
 B.Sc., Ph.D.
 Christopher Brian Johnson, B.Sc.,
 Ph.D.
 Sigrid Liede, B.Sc., M.Sc., Ph.D.
 Torbjorn Hans Ragnar Lindell, B.Sc.,
 M.Sc.
 Patrick Keith McKenna, B.Sc.
 Michael Dale Myers, H.N.D., B.Sc.
 Gianfranco Novarino, Ph.D.
 Maria Joaquina Pires O'Brien, Ph.D.
 Hew Prendergast, B.Sc., Ph.D.
 Prof. William Ball Provine, B.S.,
 Ph.D.

Dr Angel M. Roma
Alexandra E. Staikou, Ph.D.
Anthony David Thomas, B.A.,
P.G.C.E., Ac.Dip.Ed.

Jason Mark Weeks, B.Sc., Ph.D.
Dieter H. Wilken, B.A., Ph.D.
David M. Williams
Benito Valdes

Associate
Clive R. Turner

Society Meetings

After August's definitive statement that some longer meetings would have a plenary session with a Society General Meeting at 5 p.m., two meetings were arranged with General Meetings rather later. Something about it being easier to be a historian after the event than a prophet before it springs to mind. We all learn. But members' attention is drawn to the meetings on 12 March (on **Genetic Fingerprints in Birds** at 5 p.m.), on 26 March (on **Bird Distributions** with the B.T.O. all day), on 9 April (Palynology Specialist Group on **Some Aspects of Recent Palynological Research** all day), on 21–22 April (**European Deep Sea Biological Research**, two days), on 23 April (**Taxonomy—Old and New** all day), on 14 May (Hooker Lecture, **Hooker and India** at 5 p.m. with a buffet of Indian food), on 28 May (**Anniversary Meeting**, see below), 10 June (**Conversazione** in the Society's rooms) and on 17–19 June (**Systematics and Conversation Evaluation**, three days). An extra evening meeting on 30 June at 5 p.m. (tea at 4.15) entitled **The Conservation of Crop Genetic Resources to the Year 2000** will be addressed by Dr Geoffrey Hawtin, newly appointed Director-General of the International Board for Plant Genetic Resources, Rome. The 1992/93 session opens on 1–2 September (**Pattern and Process: Phylogenetic Approaches to Ecological Problems**, two days), followed on 22 September by a **Palaeobotany Specialist Group** meeting, an all-day meeting on 30 October entitled **The Impact of Global Changes on Diseases** (with the Royal Society of Tropical Medicine and Hygiene and the British Society for Parasitology) and the Annual Regional Meeting in Edinburgh on 1–2 October entitled **Shape and Form in Plants**. On 29 October 1992, there will be an all-day meeting on **The Thames Estuary: Environment and Ecology** with the National Rivers Authority and Physalia Limited. This will be the first meeting of the 1992/93 session in the Society's rooms and will be followed at 5 p.m. (tea at 4.30) by a Society General Meeting, when Fellows will be admitted and elected, and a plenary lecture entitled **Estuaries: Towards the Next Century** by Prof. A. McIntyre of Aberdeen. It will not be necessary to register for the day meeting to attend this lecture.

Iberian and, indeed, any other members of the Society should note that the Society will be arranging a General Meeting in connection with the International Ethnobotanical Congress in Cordoba from 20–26 September 1992 at which, *inter alia*, Fellows will be admitted.

The only other meetings in the 1992/93 session for which firm dates have been

agreed at the time of going to press are an all-day meeting **Translocation and Species Recovery Programmes** on 18 March 1993, with the BSBI, and a two-day meeting in Leeds on 5/7 April 1993 on **Fish Diseases in Aquaculture**, jointly with the British Society for Parasitology and its Belgian and Dutch counterparts.

Fliers for most of these meetings have already been circulated, or are circulated with this issue.

Anniversary Meeting

On 28 May at 4 o'clock

Agenda

1. Admission of Fellows.
2. Minutes of the business meeting held on 14 May 1991.
3. Ballot for new Members of Council and for the election of Foreign Members, Fellows and Associates. Council nominations for members of Council are: Drs P. E. Ahlberg (Z); J. Cohen (Z); M. E. Collinson (B); D. S. Ingram (B) and J. P. Thorpe (Z).
4. Presentation of Medals and Awards.
5. Treasurer's Financial Report and Accounts for 1991.
6. Executive Secretary's Report and review of the Session 1991-92.
7. Results of Ballots for New Members of Council, Foreign Members, Fellows and Associates.
8. Ballot for Officers.
9. Presidential Address.
10. Results of Ballot for Officers.
11. Appointment of Vice-Presidents for 1992-3.

The Anniversary Meeting will be followed by a dinner at 7.30 p.m. This will cost approximately £25. A booking form is to be found as a flier in these pages. The Society offers a special discount rate to members who wish to stay in London overnight at the Regent Palace Hotel in Piccadilly Circus. The cost of £39 per person covers accommodation, evening meal and English breakfast. Reservations *must* be made through the Society and members should contact Miss Marquita Baird here.

Members' attention is drawn to the Merlin Trust, which provides financial assistance to horticulturalists to enable them to further their knowledge of plants in the wild or in gardens. An s.a.e. to Valerie Finnis VMH, The Merlin Trust, The Dower House, Boughton House, Kettering, Northants NN14 1BJ will secure more details.

In October 1992, the Cincinnati Zoo and Botanical Garden Center for the Reproduction of Endangered Wildlife will be hosting an international workshop on animal and plant germplasm conservation. Further information from Dr Betsy Dresser, Director of Research, The Cincinnati Zoo and Botanical Garden, 3400 Vine Street, Cincinnati, Ohio 45220.

On 1-9 September 1993 the XXIII International Ethology Conference will be held in Torremolinos. Details from the General Secretary, Ap. 98033, Barcelona 08080, Spain.

Annual contribution reminder

As from 28 May 1992 the annual contribution will be as follows:

	Fellows	Associates
Linnean Newsletter	£28.00	£14.00
One journal	£40.00	£20.00
Two journals	£65.00	£45.00
Three journals	£90.00	£70.00

Student Associates remain at £2.50.

Please make sure that all standing orders are amended. For those who pay by direct debit mandate orders will be amended by the Society.

Other Meetings

Society for the History of Natural History

Richard Owen Centenary Meeting. 8th International Conference, 29 April–1 May 1992, at the Natural History Museum, Flett Lecture Theatre, Exhibition Road. Details from Gina Douglas, c/o The Linnean Society of London, Burlington House, Piccadilly, London W1V 0LQ.

Eccentric Collectors: The British Natural History Tradition

Throughout Britain there are many local and national natural history societies. This exhibition, toured by the Area Museums Service for South East England, traces the development of natural history study from Aristotle in classical Greece through Pliny, the herbalists, John Ray, Francis Willughby, Carl Linnaeus, Gilbert White of Selborne, Charles Darwin and into the present century with H. F. L. Guermonprez and F. W. Frohawk. It also introduces the world of the Victorian collector with specimen displays of fossils, seaweeds, ferns, shells, butterflies and birds and follows the development of field clubs, natural history and specialist societies. There are likely to be items relating to the Linnean Society.

The exhibition outlines natural history this century, the role of wildlife photography, radio and television, publication of popular field guides and work of the county naturalists' trusts and other bodies active in conservation. At each venue the local natural history societies will be invited to participate and display details of activities for naturalists available locally. At some venues there will be an illustrated lecture.

Venues and dates: 7 March–5 April at Ipswich Museum, Suffolk; 11 April–10 May at Horniman Museum and Library, London; 16 May–14 June at Maidstone Museum, Kent; 20 June–19 July at Dover Museum, Kent; 25 July–10 January 1993 touring in Hampshire with the Hampshire County Museums Service.

JUNE CHATFIELD

Biodiversity and the Society

The Society, with its roots in taxonomy, has every interest in seeing that current biodiversity is maintained. At its most basic, the livelihoods of many of

its members depend upon the study of biological diversity, which also affords many more great pleasure and is the resource upon which future generations will depend for food, medicines and energy.

The Society accordingly acted as host to a European Consultation on a Biodiversity Conservation Strategy Programme in July 1991. This three-day meeting was designed around a draft document produced by the International Union for the Conservation of Nature (IUCN), the World Resources Institute (WRI) and the United Nations Environment Programme (UNEP); the document was considered essentially in terms of its scientific content. As a result of July's meeting, the revised document will illuminate more intensely areas such as the marine environment and the conservation of the diversity of invertebrates and microscopic organisms, such as bacteria and fungi. Several Fellows of the Society, including the Officers, were amongst the hundred or so participants over the three days. Reports of this meeting have appeared in *The Linnean* of January 1992.

The results of this meeting will, hopefully, form part of the agenda for the United Nations Commission on Environment and Development (UNCED) in Brazil in June 1992. Four of the Officers, including the President, also attended a broader based two-day meeting at the Royal Geographical Society on 9–10 October 1991 organized by the UK branch of UNEP entitled "Our Agenda for UNCED", designed to give non-governmental organizations (NGOs) a hand in formulating submissions to UNCED.

UNCED could be a major event in the world political calendar, with some 35 000 expected including prime ministers and presidents. Already there have been three preparatory meetings; a fourth will be held in the spring of 1992. Ethical concern over environmental matters led to the EC hosting a conference on the subject for the G7 nations, as a result of which a Working Party was set up under the chairmanship of Professor Sam Berry, a Past President of the Society, to produce a "Code of Environmental Practice". This was submitted to the G7 Heads of Nations meeting in Houston in 1990 and published by the Royal Society (*Science and Public Affairs* 1990, 5(2): 13–23). Professor Berry has also chaired a Working Party for the Anglican General Synod; a report on "Christians and the Environment" was given to the Synod in July 1991. Both this and the G7 report centred round a statement that an environmental ethic should involve "stewardship of the living and non-living systems of the earth in order to maintain their sustainability for present and future, allowing development with forbearance and fairness". The October meeting included a Workshop on the Earth Charter being prepared for UNCED, chaired by Professor Berry with the Executive Secretary as rapporteur. It accepted the statement on stewardship but added that health, security and quality of life were ultimately dependent on such stewardship. Such statements may seem sensible enough, but coming to enforceable international agreements on terms like 'sustainability' and 'fairness' is likely to be beyond UNCED. Indeed, Sir Crispin Tickell warned the delegates at the October meeting to be realistic about just what can be achieved. This was likely to be the lowest common denominator of the various interests, i.e. not much. Others, including Professor David Pearce of UCL, attempted to characterize sustainable economies and to examine the roles of national and local government, business, trade unions and women's organizations in them. Eleven working groups tackled topics from the human population

(which most recognized as the most pressing problem) to water resources and reported back at the end of the meeting. One working group was concerned with the conservation of biodiversity, and Society Officers attended its meetings. Inevitably, over two hundred delegates representing some 50 organizations from the BMA to the RSPB make for disagreements, but these were mainly on questions of emphasis. All recognized the dire state of the planet, all wanted UNCED to succeed in some measure. Whether that willpower exists at Governmental level remains to be seen.

Taxonomy and Plant Conservation at the University of Reading

One theme which emerged from the various conferences, consultations and workshops on conservation and biodiversity which took place over summer 1991 is the need for more biologists with some training in taxonomy. Until plants and other organisms are identified accurately, reliable inventories cannot be made and 'hot spots', in which diversity is concentrated, cannot be located. Individuals of particularly sensitive or endangered species may need to be mapped and their numbers monitored at different stages of their life cycles, so seedlings or immature plants must also be recognized and identified accurately. Where valuable populations are endangered or cannot be conserved *in situ*, seeds must be collected and maintained and/or multiplied *ex situ*. The plants from which these seeds are collected must likewise be securely identified even though no flowers may be present.

Species also have to be identified before the literature can be searched for information relevant to their conservation. Guidance on optimal conditions for seed storage and ex-situ germination may come from published work on related species. Some species survive and regenerate in the wild because they have co-evolved with, and are dependent on, other species (for example, plant and pollinator, or plant and symbiotic microorganism). All partners in such relationships must be identified and included if conservation of the dependent species is to succeed. Different strategies may be needed for self-pollinated, cross-pollinated and vegetatively reproducing species.

The University of Reading has for many years offered an M.Sc. Course in Pure and Applied Plant and Fungal Taxonomy. In August 1990, the School of Plant Sciences was asked by the Plant Conservation Office of IUCN—The World Conservation Union—to provide in addition a 3–4 month postgraduate training course in Taxonomy for Plant Conservation. The United Nations Environment Programme sponsored the course, which ran from January to April 1991. Although organization of and recruitment for this course had to be done on a very tight schedule, 31 applications from 18 different countries were received. Seven applicants from countries in three continents were awarded UNEP-sponsored places, and braved the British winter to take these up.

Since both the need and the demand for this training are evidently still unsatisfied, the course will be offered again from January to April 1992. As before, it will comprise ten weeks of lectures, seminars and practical classes at the

University of Reading, covering core topics such as study of species distributions, herbarium techniques, identification of flowering plants (and neglected but useful indicator groups such as bryophytes and lichens), databases and ex-situ conservation. A limited number of optional, more specialized, courses may also be taken. The Reading-based component of the course is followed by a week in which participants see something of the work of the Royal Botanic Gardens, Kew, as this relates to taxonomy and conservation, and the course ends with two weeks of field work in southern Spain.

The course organizers hope that a limited number of sponsored places will be available for the 1992 course, but these will again be primarily for applicants from developing countries. Applications from elsewhere are very welcome, but such applicants will need to obtain their own funding. For further information, please contact Dr Barbara Pickersgill, Department of Agricultural Botany, School of Plant Sciences, University of Reading, Whiteknights, Reading RG6 2AS, U.K. (tel.: 0734 318096; telex: 847813 RULIB G; fax: 0734 750630). Information on the M.Sc. course in Pure and Applied Plant and Fungal Taxonomy can be obtained from Dr Royce Longton, Department of Botany, School of Plant Sciences, University of Reading, Whiteknights, Reading RG6 2AS, United Kingdom (tel.: 0734 875123 ext. 4083; telex: 847813 RULIB G; fax: 0734 750630).

From the Archives

Bourbon, December 3rd 1865

My Dear Dr. Hooker,

When I last wrote to you I was at Tamatave, in a very imbecile condition from fever, and about to take the advice of the Consul and others to quit at once, to escape worse consequences, as the bad season was commencing. Finding after the rains set in, that I could not get up to the Capital or hope to get rid of fever at Tamatave, I came here where I have soon lost the worst part of my malady and have got well enough to begin collecting; and whilst waiting to hear in what way I could best employ the time, have consulted the Museum here, and find that the Orchids deserve special attention, as they have not had any of late, and Lindley is emphatic in his counsel to make a further investigation. Of the 96 species Mauritianae there are several Borbonicae marked * and particular advice is given to make drawings of those whose flowers are small and difficult of dissection after drying. In going over ferns with Sir H. Barkly at Reduit, and making a list for guidance, I saw that in the 184 species common to Mauritius there were seven referred to as peculiar to Bourbon. I have therefore begun a collection of the whole; a not very difficult task, as the ravines visited have readily offered abundant scope for the professional or amateur collector, that is to say, they are rich with varieties. As yet I have only been to a height of 3,800 feet, but at Salazie (the Sanatorium) and Giloes and Piton de Neige, the highest points, I may hope to find all those not to be met with in the lower ravines. For the rest, I await instructions from you, and should you wish a general collection, would hope to be able to send one in six weeks from the time of receiving your

letter. It would be folly for me to dare the Madagascar coast before the end of February. Almost all Europeans (all who can) leave the coast for this, or Mauritius until the rains are nearly over, and the Consulates, both French and English, were both empty 3 weeks after I left Tamatave, the unfortunate Consuls both getting an early dose of the all-powerful Miasmas: They are here now for the Madagascar bad season. I hope the arrangement I concluded with Sir Henry Barkly meets your *approval*. Mr. Horne is indefatigable in his calling, and has been gathering praise from all sides for the able manner in which he has superintended the alterations and additions to the gardens, commenced in Duncan's time but more effectually carried on under the direction of Mr. Horne. Should I but get a little health back, I might hope to send cases of living specimens frequently to the Gardens, by the vessels leaving Tamatave. Those procured during my short stay at Tamatave and brief visit to the first forest, got to Mauritius without accident, and there would be no difficulty in transit for the interior as the natives are such allies with us now, that they are only too glad to show their fidelity in any way—They make obstacles however to Europeans visiting parts far removed from Antananarive, preferring much that they should keep to the coast—a disagreeable prejudice, and lately of serious importance to Mr. Gerrard, who has been lying ill for some time past at Mohambo, a port on the East Coast, North of Tamatave. The Mauritius Council have voted Gerrard £100 per annum, for which he is to send specimens in Natural History. He has of late addicted himself entirely to birds and reptiles, but as Governor Barkly takes more interest in Botany than other branches and has written to him on the subject, we may expect from Mr. Gerrard something botanically from the fine grounds of the North, to which (when I last heard of him) he was about to start. The best routes from the Capital, (to which it seems advisable to go first) are North Eastwards, and N.W. to Vohemar and Bembataska. Had I been able to get to the Capital, the Governor of Tamatave was willing to give me every assistance (through his family living on the route) to find my way to both; and I have no doubt both journeys are feasible enough, and would repay the wayfarer. I have come down from the hills to send this by the French Mail about leaving, in order that I might be able to hear from you by next from England. Meanwhile, I will go on with ferns, and orchids. French officials made objections to the admission of paper for collecting, at first charging so absurdly high a duty (\$25) that the paper would cost, if bought in sufficient quantity for a general collection, about £20–£30. I demurred, and after days of palaver and writing got permission to have little by little doled out to me, the duty remitted. Any collecting, other than plants, strictly 'defended', but that is of no great importance as a Mr. Smith the present Director of the Museum (successor to M. Morel), is employing himself generally for birds, insects etc. with a view to replenishing the Museum. Mr. Pollen, Aide Naturalist of the Leyden Museum, has also been here and is at present at the French Station Nojsibe, Madagascar, from which he will make excursions to the Mainland, after the worst of the bad season has passed. With kind regards to Mrs. Hooker, and remembrance to *Master*, and best wishes for your health

Believe me to be
My dear Mr. Hooker,
Faithfully yours,
Charles J. Meller

Picture Quiz

The January Quiz (8(1): 11) figured the medical botanist Robert John Thornton (1768?–1837).

Educated privately by the vicar of Kensington, Robert Thornton went up to Trinity College, Cambridge at the age of 16 intending to enter the church. But the death of his brother eased the family finances and he decided to make his career in medicine; thus at the end of his first year he began attending the botany lectures given by Thomas Martyn and then subsequently left Cambridge and entered Guy's Hospital medical school

He started practising in London in 1792 and for four years acted as physician to the Marylebone dispensary. During this time he published *The Philosophy of*



Who (clue—imitating his teacher?) Solution by July to the editor. Prizes include valuable reprints etc.

Medicine being . . . including . . . the doctrine of Pneumatic Medicine (1796) which speedily went into five editions. Thornton not only acquired a considerable practice but was also genuinely interested in medicine and was a founder member of the Medical Society of London. However, the year he commenced work he began preparing what was to become a really sumptuous tome (in imperial folio) entitled *New Illustrations of the Sexual System of Linnaeus* which was published between 1799 and 1807. It was called new to differentiate it from a book of the same name by John Miller (1777) whom Thornton obviously decided to out-do by engaging the most distinguished artists and poets as well as the best

copper plate engravers to help him with his publication. Unfortunately this very splendid work all but ruined him financially. Nevertheless, he still found the money to re-issue or publish separately the third section (previously published in 1799 as *Picturesque Botanical Plates of the New Illustration*—price 20 guineas) in 1804 as *The Temple of Flora or Garden of Nature, being Picturesque Plates* (= *Temple of Flora*).

Meanwhile, Thornton had succeeded James Edward Smith as lecturer on medical botany at Guy's Hospital and in 1806 wrote a paper (*Vaccinae Vindiciae*) in support of Jenner's application to Parliament for aid in the promotion of vaccination (the House of Commons voted Jenner £20 000 in 1806). Thornton had apparently been introduced to Jenner by Banks who had

Robert John Thornton M.D. late of Trinity College Cambridge, being desirous of becoming a Fellow of the Linnean Society, we the undersigned, knowing him to be a practical botanist, particularly well versed in the physiology of plants, recommend him to be accordingly elected.

George Shaw.
N. L. Lambert
J. Corréa de Serra
James Sowerby

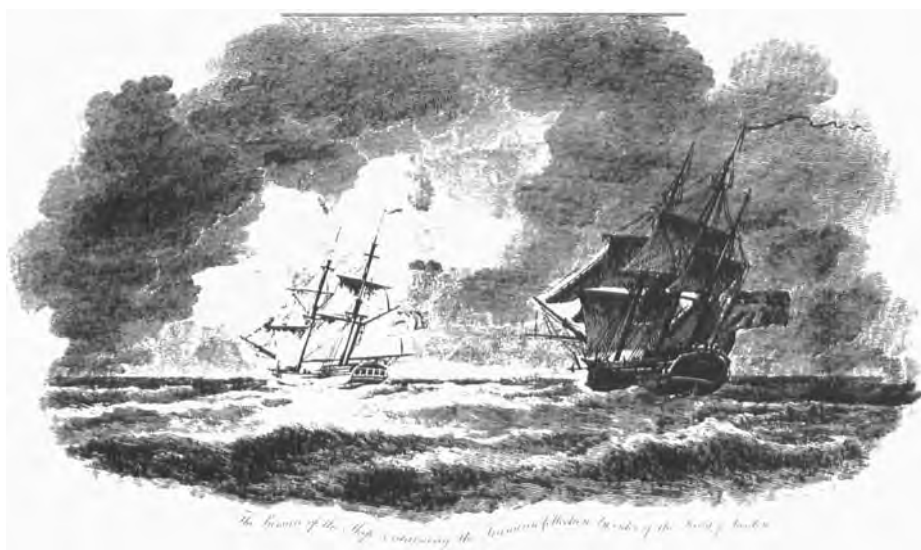
24th. May 1797

Thornton's certificate of recommendation for election, dated May 24 1797.

employed him (Jenner) to prepare some of Cook's 1771 specimens. Jenner's success prompted Thornton (who was by now in dire financial straits) to lobby Parliament on his own behalf. Having secured the patronage of the Prince Regent he persuaded Parliament in 1811 to pass an act allowing him to organize a lottery of his botanical works which he advertised as *The Royal Botanical Lottery*. Some ten thousand prizes were awarded (tickets 2 guineas each)

including the original paintings for the *Temple of Flora* as well as several thousand copies of a new edition (1812) of the *Temple of Flora* re-engraved on a smaller scale and a thousand copies of his (Thornton's) *Elements of Botany*. The lottery was unfortunately a failure and when Thornton died in 1837 his family was left almost penniless.

Another factor which contributed to Thornton's penury was that some of his peers regarded him as a charlatan or medical quack¹ (viz. Sir Joseph Banks, President of the Royal Society). Thus despite being a friend of Smith's he never became a member of the Linnean Society. His form of recommendation (see above) is in Smith's handwriting and his supporters included George Shaw (one of the founders of our Society) Alymer Lambert and James Sowerby. The certificate was presented to the 18 July 1797 meeting. The Minutes record that it was not balloted on presumably because there was not a quorum of members



The pursuit of the British ship carrying Linnaeus's collections.

present. Despite this the Secretary wrote on the reverse "Ballotted, but not elected 18th July 1797". Moreover a letter from Martyn to Smith dated 20 Sept. 1797 makes it quite clear that Thornton was in fact blackballed (Foxon, 1971)².

Ironically, today our Society produces a coloured postcard for sale with a picture of the founder and first President (by W. Ridley) set above an unattributed engraving showing the boat carrying the Linnean Collections to Smith in England being chased in the North Sea by a Swedish gunboat. Robert John Thornton painted the apocryphal pursuit!

There was only one correct answer to this Quiz from S. P. Dance.

¹Presumably since he believed in the curative power of the inhalation of certain gases = pneumatic medicine.

²*Guy's Hospital Reports*, 120(1): 57-87.

Correspondence

20.10.91

Dear Professor Gardiner,

As one interested in orchids I made it a point to visit Prof. Holttum on my trip to the U.K. in 1968. We corresponded after that and I asked him to contribute the prefatory chapter in volume I of my series *Orchid Biology, Reviews and Perspectives*. These chapters are intended to honor eminent persons in the field. Prof. Holttum obliged and those who may wish to read an autobiographical contribution by him should refer to:

HOLTTUM, R. E., 1977. A personal view of orchids. In J. Arditti (Ed.), *Orchid Biology, Reviews and Perspectives, Vol. I*: 15–24. Ithaca, N.Y.: Cornell University Press.

Kwan Koriba, the Japanese war-time director of the gardens, is reported to have said that “there is no nationality in the field of science” and was indeed kind to Holttum and others. Those interested in more details about this period in Singapore and its Botanic Gardens and in some of the people who played important roles at that time should refer to:

CORNER, E. J. H., 1946. Japanese men of science in Malaya during the Japanese occupation. *Nature*, 158: 63.

CORNER, E. J. H., 1981. *The Marquis—A tale of Syonan-to*. Singapore: Heineman Asia.

ARDITTI, J., 1989. Kwan Koriba: Botanist and Soldier. *The Gardens' Bulletin, Singapore*, 42: 1–17.

Gunnar Seidenfaden's assessment of the *Orchids of Malaya* is accurate, but my view is that Holttum's book is one of the very best ever written about orchids in general.

Despite being deaf, Holttum travelled and lectured well into his eighties. In 1981 he gave the keynote address at the Orchid Symposium organized by Leonard Lawler and Ronald D. Kerr of the Orchid Society of New South Wales as a satellite function of the 13th International Botanical Congress which was held in Sydney, Australia. He also visited Singapore several times at least once c. 1982.

Orchid hybrids have also been named after Holttum's wife and daughters. They are *Aranda* Deborah, *Arachnis* Catherine and *Dendrobium* Ursula.

My comments here are intended as an addendum to the obituary by Prof. William T. Stearn and I write this letter for the sole purpose of adding more details to the historical record. Another impetus for it is the fact that the late Prof. Holttum and I are among those who have been awarded the Gold Medal of what was the Malayan Orchid Society in 1963 and is now The Orchid Society of South East Asia. Holttum was one of its founders. Also, having spent many summers and sabbatical leaves at the Department of Botany, National University of Singapore (in my time Prof. A. N. Rao was its Chairman) I consider the Department Holttum founded to be my second academic home.

Sincerely Yours
JOSEPH ARDITTI

Earthwatch Europe: Call for research proposals

Earthwatch Europe invites proposals for field research in its 1993 programme or later. Grants of £5000 to £50 000 are available. Earthwatch supports both basic and applied research and proposals of an interdisciplinary nature are welcome. The research must be labour-intensive, able to use non-specialist field assistants, and at post-doctoral level. Earthwatch wishes to encourage projects concerned with processes which shape the environment at the local, regional and global level and with biodiversity and how this is affected by human activities. The volunteer field assistants are recruited from Earthwatch's international membership and contribute funds as well as enthusiasm. All proposals are subjected to rigorous peer review and should be submitted 12 months before the proposed fieldwork dates.

Please write for further details to: Jane Corbett, Science Programme Director, Earthwatch Europe, Belsyre Court, 57 Woodstock Road, Oxford OX2 6HU.

Note: Earthwatch is an international charitable organization which was founded in Boston U.S.A. in 1971. The European office in Oxford opened in January 1990. The Chairman of Earthwatch Europe is Sir Crispin Tickell, GCMQ, KCVQ; Professor Sir Richard Southwood is Chairman of its Science Advisers' Group. The international membership is at least 75 000. In 1990, Earthwatch dispensed £1.3 million in grants and 300 000 hours of labour to 170 researchers in 49 countries.

DR PEGGY VARLEY

Appeal for Information

Mr A. G. Bourne, F.R.S., spent his working years in India as university teacher, Principal of Presidency College, Madras, Director of the School Education of Madras State, and finally Director of the Indian Institute of Science, Bangalore, India. He retired to England and died at Dartmouth in 1940.

One of his most creative scientific contributions was an excellent and comprehensive collection of south Indian flowering plants (happily preserved in Kew). Unfortunately this fine contribution remains unacknowledged; I wish to rectify this omission by dedicating my forthcoming volumes of the *Flora of the Palni (Pulney) Hills* (the montane counterpart of the *Flora of the Tamilnadu Carnatic* (1981-88)) to him and his wife. Lady Bourne deserves to be remembered in her own right for she not only organized all the collections and then deposited them in Kew, but she also made exquisite water colour paintings of south Indian plants.

The following lines from his Obituary by the Royal Society is all the information I have.

"He married, in 1888, Emily Tree Elaisher who survives him. He leaves a son, Ray, so named after his godfather Sir E. Ray Lankester, who gained experience in the Indian Forestry Service, became a lecturer at Oxford and now is a well-known consultant, and a daughter, Nora, wife of Mr Stephen Cos, C.I.E., who was Chief Conservator of the Indian Forester Service in the Madras Presidency".

I shall be grateful if anyone can identify someone in the lineage of the Bournes, who may have more information on them, and particularly photographs. My address in India is: Director, The Rapinat Herbarium, St Joseph's College, Tiruchirapalli 620 002, India.

K. M. MATHEW

Floras

Foreign Floras—a catalogue of foreign floras will be offered by Mike Park in July/August this year. They are mainly 20th-century, with a large section of mid-European and Russian interest. Any fellow wishing to receive a copy should write to: Mike Park, 351 Sutton Common Road, Sutton, Surrey SM3 9HZ (a first class stamp would be appreciated).

Erasmus Darwin and Tropical Rain Forests

Erasmus Darwin (1731–1802), grandfather of Charles, lived in Lichfield from 1756 to 1781. He was a medical practitioner and a founder member of the Lunar Society of Birmingham which included Joseph Priestley, Josiah Wedgwood and other distinguished scientists and engineers of the day. The Lichfield Science and Engineering Society, which started in 1985, has a full programme of lectures and other activities. In 1990 it established the Erasmus Darwin Memorial Lecture; Professor Richard Dawkins gave the first Lecture on 21 November 1990 and I had the honour of being invited to give the second Lecture on 20 November 1991. Both were held in the Civic Hall and were attended by nearly 400 people, including the Mayor, the Sheriff, the Dean of Lichfield Cathedral and several groups of sixth-formers. I was asked to speak about tropical rain forests and by way of introduction I reflected on what was known in Europe, about the trees of these forests at the time Darwin was in Lichfield. My reading in preparation for this part of the Lecture revealed several points which may well be of interest to Fellows of the Linnean Society.

The period of Erasmus Darwin's stay in Lichfield was an important one for tropical botany including, as it did, many publications by Carl von Linné and Sir Joseph Banks's voyage with Captain James Cook. William Stearn and others have pointed out that most of the tropical plants known to Linnaeus came from the coastal ports and the mangrove swamps and are very widespread, so much so that Linnaeus concluded that the flora of the tropics was much the same wherever one went. The trees, shrubs and weeds of the ports had already been distributed by Humankind (a word used by Erasmus Darwin in 1791) and those of the mangrove swamps are widespread for good biological reasons.

Captain Cook and his party on the *Endeavour* reached Rio de Janeiro in November 1768 but the Portuguese authorities refused them permission to land. Banks did, however, evade the authorities and went ashore for a whole day (26

November 1768), and on another day when they were leaving Rio. For the most part, however, his botanizing and that of his assistant Daniel Solander, was restricted to the greens brought to the ship to feed the animals.

The entry for that day ashore in his journal is, of course, full of interest. He met several of the inhabitants who were very civil and took him to their houses; he bought 'a porker midlingly fat for 11 shill, a muscovy duck something under two shill, etc'. The country that he saw 'abounded with vast variety of plants and animals, mostly such as have not been described by our naturalists'. Some 245 specimens were collected, the plants being mostly herbs and shrubs. His



Erasmus Darwin (1731–1802).

journal makes special mention of the bromeliads and there is a particularly interesting entry which reads:

"The growth of RIZOPHORA also pleased me much tho' I had before got a very good idea of it from Rumphius who has a very good figure of the tree in his *Herb. Amboin.* Tab. . . .'

The word 'Rizophora' was crossed out and the number of the plate in *Herb. Amboin.* was never added. Beaglehole (1962) in his edition of the *Endeavour* Journal of Joseph Banks omits the word 'Rizophora' and says in his note that the word was 'Rizophane' or 'Rizophanes'. However, reference to the facsimile

edition of the journal in manuscript (Lysaght, 1980) shows that Banks had written 'Rizophora' and reference to Rumphius's *Herbarium Amboinense* (1750)—which was in the considerable library Banks took on the voyage—shows that several mangroves were illustrated, including species of *Aegiceras*, *Avicennia*, *Bruguiera*, *Ceriops*, *Rhizophora* and *Sonneratia*. With so many mangroves to choose from, one can well understand Banks's indecision but, I suggest, the 'very good figure' was of *Rhizophora candelaria* DC and the mangrove he saw was the Atlantic species *Rhizophora mangle* L.

Two species of mahogany—Cuban and Honduras—were well known in 18th century Europe. The Spanish were, indeed, building fine ships in Havana, using Cuban mahogany, from the 17th century (Albion, 1926). This species was well described botanically by Mark Catesby in 1743, named *Cedrela mahagoni* by Linnaeus in 1759 and transferred to a separate genus as *Swietenia mahagoni* (L.) Jacquin in 1760. Cuban mahogany has a close grain and, as Catesby (1743) reported, for ship-building had properties 'excelling oak and all other wood, viz. durableness, resisting gunshots and burying the shot without splintering'. Honduras mahogany, on the other hand, is more easily worked and has a more decorative grain; it was this species that was so highly prized for furniture by Chippendale and others in the 18th century. The fashion of the day is encapsulated by the following lines from the poem 'On luxury' by Thomas Warton the Elder (1748):

'Odious! upon a walnut-plank to dine!
No—the red-vein'd *Mohoggony* be mine!'

The formal botanical description and name of this species as *Swietenia macrophylla* G. King were, in fact, based on material grown in the Calcutta Botanic Garden and were not published until 1886.

The Oxford English Dictionary (1989) states that the origin of the word 'mahogany' is unknown. It is not a Caribbean or Spanish name, but a very thorough study by F. Bruce Lamb (1963) makes a good case for derivation from the name 'oganwo' used by the Yoruba (in SW Nigeria) for the West African Mahogany *Khaya ivorensis* A Chev. Yoruba people were among the slaves brought to the West Indies and Lamb considers that the word 'mahogany' originated in Jamaica in the 17th century from the Yoruba, with Portuguese and English contributions.

Another very important timber for ships is teak. There is an excellent description and drawings of this in van Rheedé's *Hortus Malabaricus* (1673) but Linnaeus did not pick this up and it was his son who provided the botanical name *Tectona grandis* L.f. (1781).

Among other trees of the tropical rain forest *Cinchona* (quinine), *Theobroma* (cocoa) and *Coffea* were known in Erasmus Darwin's time, indeed one of his poems in *The Loves of the Plants* (1789) is about 'CINCHONA, fairest of Peruvian maids'. A footnote to this relates how *Cinchona* bark was found to cure 'an epidemic fever of a very mortal kind' in Loxa, Peru. The Para rubber *Hevea brasiliensis* (A Juss.) Muell. Arg. was not known at the time but so called 'elastic gums' particularly from the genus *Ficus* were known and Darwin was one of the first authors to mention 'India rubber'. The name 'rubber' was in fact coined by Darwin's friend Joseph Priestley because it would rub out pencil marks.

Within the Linnean Society we should pay our respects to Erasmus Darwin

who translated several of Linnaeus's works into English and in so doing introduced some 50 botanical words into the English language, including aril, bract, raceme and stipule (see King-Hele, 1988). Darwin was elected F.L.S. in 1792. The standard biography of Erasmus Darwin is by Desmond King-Hele (1977) to whom I am personally much indebted for advice and encouragement. This biography refers to a character sketch of Erasmus by Charles Darwin which was published with the English translation (1879) of E. Krause's biography of Erasmus Darwin.

R. W. J. KEAY

REFERENCES

- ALBION, R. G., 1926. *Forests and Sea Power* Cambridge, Massachusetts: Harvard University Press.
 CATESBY, M., 1743. *The Natural History of Carolina, Florida and the Bahama Islands*. London.
 DARWIN, C., 1879. In translation of *Erasmus Darwin* by E. Krause.
 DARWIN, E., 1789. *The Loves of the Plants*. Lichfield.
 DARWIN, E., 1791. *The Economy of Vegetation*.
 KING-HELE, D. G., 1977. *Doctor of Revolution: the life and genius of Erasmus Darwin*. Faber.
 KING-HELE, D. G., 1988. Erasmus Darwin, Man of Ideas and Inventor of Words. *Notes and Records of the Royal Society* 42: 149–180.
 LAMB, F. B., 1963. On further defining mahogany. *Economic Botany* 17: 217–232.
 OXFORD ENGLISH DICTIONARY, 1989. Page 205.
 RHEEDE, H. A. VAN, 1673. *Hortus Malabaricus*, 4: 57, t. 27.
 RUMPHIUS, G. E., 1750. *Herbarium Amboinense*, 3: 108, caput 61, t. 71 & 72.
 WARTON, T., 1748. *On Luxury*.

What Selection?

In these pages I have described a number of molecular biological phenomena, all reasonably well characterized, which seem to have no rational explanation at the present time.^{1–3} These include editing in trypanosomes, where additional bases are added to the RNA transcript prior to protein synthesis, the general presence in the DNA of eukaryotes of large amounts of DNA (“junk”) to which no satisfactory function has been ascribed and chromatin diminution, where in some invertebrates, junk DNA is discarded from somatic cells to leave them with anything up to 50% less DNA from germline cells. To these must be added the recent observations on directed mutation, mainly in prokaryotes, where the incidence of back mutations in genetically defective mutants is much higher and more specific than might be expected on a random basis. In an article in *Nature* Cairns *et al.*⁴ examined an old favourite, *E. coli*, unable to utilize lactose as a carbon source. Plated cultures were allowed to remain on a lactose-free minimal culture medium for some days without growth, during which time they accumulated mutations; the cultures were then provided with a lactose-containing medium. The appearance of lactose-metabolizing mutants seemed to be relatively independent of the time on the minimal culture medium and thus very directly dependent on the presence of lactose. As the authors put it “cells may have mechanisms for choosing which mutations occur.” In the same issue, under the title ‘A Unicorn in the Garden’, Stahl⁵ asked simply “What’s up?” as did many others in subsequent issues.^{6–8} Most were incredulous that so fundamental a tenet of modern biology should be in question. Cairns admitted, both in the

original paper and in reply to critics,⁹ that the experiments were not watertight, although others had obtained similar, though mostly unpublished, results. Why had this phenomenon not been noticed before? Mainly because no-one had thought of looking for it. Most previous work had placed the bacteria under selection pressures straight away, without giving a chance for mutations to accumulate under essentially neutral conditions, conditions which critics have pointed out may be less neutral than they seem, since some mutations may have benefits to the survival of the cells, and some cells may die, and be cannibalized by others. However, the worms seem well and truly out of the can. Thus, for example, Hall¹⁰ has shown that a doubly mutant *E. coli*, defective in salicin utilization, reverts at a rate several orders of magnitude higher than expected when provided with salicin as a sole carbon source. In parallel experiments, involving tryptophan synthesis mutants, Hall has found, by sequencing of the appropriate gene sequence (some 1700 base pairs), little evidence of the other random mutations which might be expected.¹⁰ Such *directed* mutation has been called Cairnsian mutation after its discoverer.

So should the Society replace its portrait of Darwin with one of Lamarck? Those involved seem most reluctant to draw the obvious conclusion. These bizarre effects are not believed to be of wide occurrence, although we need to note that such was also believed to be the case for the mobile genetic elements—transposons—originally discovered in maize.¹¹ Now transposons are being found everywhere, and are believed to play a unique role in mutation, particularly since, once inserted into a sequence, they are difficult to dislodge by back mutation. A remarkable feature of the salicin-utilization mutations referred to above is that one of them is the result of transposition, and reversion would be expected to be an even more improbable event for such a mutation than for a straightforward base substitution. Yet this, apparently, is not the case.

Although much sophistry has gone into explaining—or debunking—some of these results, they do seem to be on a firm foundation of experimental fact, and explanations are far from intellectually satisfying. Much hinges on the initial recognition by the cell of long stretches of DNA, with a view to modifying it specifically. Currently DNA recognition involves either proteins, which are capable of binding specifically to relatively short stretches of DNA, maybe represented by a couple of score of bases, or RNA, which acts as a primer in DNA replication and in this role again recognizes only limited segments of the DNA. We do know that proteins called enhancers act to increase DNA transcription, but at considerable distances (several hundreds of bases) from the beginning of the transcribed gene. This has been attributed to quaternary folding of the DNA so that bases linearly some distance apart are brought together. It is, of course, perfectly possible that mutations, particularly those which are the result of deletions or additions (as in transposition) disrupt the quaternary structure of DNA and thus betray their presence. But what can recognize long stretches of DNA? The answer must be similar long stretches of DNA or RNA. Only they have the ability, by base pairing, to recognize and bind to long sequences of DNA. It has to be said that certain proteins—histones—do bind to *eukaryotic* DNA over its entire length, but perceived wisdom suggests that this is a non-sequence-specific binding serving only to hold the DNA in a compact structure, the nucleosome. Such proteins are not found in prokaryotes, but for all organisms there remains another question; how

are specific genes found and transcribed within the genome from the highly condensed DNA of the chromosomes or their prokaryotic counterparts, which may be up to 5000 times shorter than their extended base-paired length? Again, we have a problem of recognizing specifically long lengths of DNA in a much larger chromosome.

In the early days of our understanding of the control of transcription (see ref. 12), Jacob and Monod realized that repression in bacteria must involve some molecule which could recognize specific sequences in DNA in order to block transcription and initially suggested that this molecule would turn out to be an RNA, since that was the only molecule which at that time (1961) seemed to be capable of doing this (other than DNA, which was then, as now, assumed to have a relatively passive role). In 1966, Gilbert & Muller-Hill showed that the repressor molecule of the *lac* operon was a protein. However, the logic that DNA recognition is best achieved by some other nucleic acid molecule is not vitiated by this discovery; it is clear that protein repressors recognize only a very few bases in the DNA at their binding site. For more extensive recognition, only a nucleic acid molecule will do.

So are there undiscovered nucleic acid molecules in the cell that can mediate some or all of these functions? There are a number of candidates. The replication of doubly stranded DNA on one of the strands is discontinuous, because DNA synthesis proceeds in opposite directions on each strand. As the DNA unwinds, on one strand, DNA synthesis proceeds by the formation of a large number of fragments—Okazaki fragments—which are subsequently joined up to provide a continuous strand. If more Okazaki fragments are produced than are needed, could the surplus be put to use to recognize sequences of DNA, a process which they should be perfectly capable of? And there are rather more DNA polymerases, the enzymes which multiply DNA, than can be found a use for in the cell. Is some DNA produced which is not incorporated into chromosomes? RNA certainly has more than a single function in the cell—it forms some of the building blocks of the ribosome, it forms an activator for amino acids in protein synthesis (transfer-RNA), and it acts as a primer in DNA synthesis, as well as being the transcript by which the genetic message is converted to proteins. We know that RNA molecules are capable of catalysing their own modification and that of other RNA molecules, so-called ribozyme activity, similar to that achieved by enzymes, but ribozymes only act on specific RNA sequences. It is an activity which seems widespread. And certain viruses elaborate an enzyme—reverse transcriptase—which copies RNA into complementary DNA. Could RNA be the magic molecule by which the cell is able to find and modify specific DNA sequences? Could ribozyme activity, the catalysis by RNA molecules, extend to DNA? It is hard to see how such a mechanism could be invoked to cause specific back mutation. Already, ribozyme activity is being pressed into service to explain editing,¹³ and as Cairns himself says⁹ “in the processing of biological information, almost anything is possible”. Amen.

JOHN MARSDEN

REFERENCES

1. *The Linnean*, 1990, 6 (2): 16–17.
2. *The Linnean*, 1990, 6 (3): 17–19.
3. *The Linnean*, 1991, 7 (3): 20–22.

4. Cairns, J., Overbaugh, J. & Miller, S., 1988. *Nature*, 335: 142–145.
 5. Stahl, F. W., 1988. *Nature*, 335: 112–113.
 6. *Nature*, 336: 21–22.
 7. *Nature*, 336: 525–527.
 8. *Nature*, 337: 119–120.
 9. Cairns, J., 1988. *Nature* 336: 527–528.
 10. Hall, B. G., 1991. *The New Biologist*, 3: 729–733.
 11. McIntock, B., 1952. *Cold Spring Harbor Symposium on Quantitative Biology* 42: 13–47.
 12. Whitehouse, H. K. L., 1973. *Towards an Understanding of the Mechanism of Heredity*. London: Edward Arnold.
 13. Bass, B. L., 1991. *Nature*, 352: 283–284.
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Lignum Vitae: the Wood of Life

The pockwood tree, or lignum vitae as it is better known, is a native of the West Indies especially Jamaica, Hispaniola, the Bahama archipelago, Trinidad and Tobago.

It is a short-trunked, round-headed, evergreen tree reaching a height of some 40 feet. The wood is very hard and dark; olive-brown within, whitish towards the bark, and has a peculiar aromatic scent. The fragrant flowers which open mostly during dry weather (June–September; February–March), are pale blue, on simple axillary clustered stalks.

The native name for it is guaia or guayacau from which its proper name *Guaiacum officinale* L. was derived. The appellation ‘Lignum vitae’, however, refers to its alterative properties in particular to its use as a specific in the treatment of venereal disease, chronic rheumatism and gout.

Guaiacum wood was apparently first employed by the natives of Santa Domingo as an antidote against venereal disease as early as 1450. Thus the colonizing Spaniards soon acquired a knowledge of its presumed virtues (Sloane, 1725) and introduced it into Spain as early as 1501. The first known importer of it was Gonsalvo Ferrand of Seville—who being infected with the great pox went to the West Indies, to ascertain how the natives in that part of the world treated themselves. He had been told that the disease (referred to there as the French pox) was very common in most of the major ports of the Caribbean (Freind, 1720). He subsequently returned to Spain with a considerable quantity of guaiacum wood and set himself up as a practitioner, charging seven gold crowns a pound for the imported timber! Nicholas Poll (1738) reported that “within 9 years of its introduction into Europe more than three thousand persons have derived permanent benefit from its use”. Nevertheless, it did not get mentioned in the *London Pharmacopeia* until as late as 1677.

Throughout the remainder of the 16th century most medical practitioners contended that guaiacum wood was a true specific having the power of curing venereal disease and of expelling the poison from the system. This conviction was so widely held that the practice of using mercury ointment was not only discontinued, but also publicly censured. Interestingly, this opinion that guaiacum was a true specific (for venereal disease) was revived and ably supported over a century later by that eminent physician and acquaintance of Linnaeus’s, Dr Hermann Boerhaave who mixed it with sarsaparilla. Nevertheless, by this time (1730s) many medical practitioners had already reintroduced the frequent use of mercury for the treatment of the great pox. So when Linnaeus wrote to

Sauvage (1738: see *Linnean*, 1(1): 14) for his remedy explaining in the letter that a cure would be worth 3 gold crowns to him (Linnaeus), Sauvage entreated him to regularly apply mercury ointment.

Linnaeus only later became aware of the efficacy of *lignum vitae* in the treatment of syphilis, probably through eventually reading Sloane (1725) where it was reported that "the wood boiled in water . . . helps the French pox and stoppage of urine". Linnaeus subsequently incorporated this information into both his medical notes and into his *Materia Medica* (1772) where he states that extracts of *Guaiacum officinale* L. are used for the treatment of syphilis and leucorrhoea. Miller (1768—*The Gardeners Dictionary* etc.), however, noted that

[illegible]

extracts of the bark and wood may be used in the diet to purify and cleanse the blood and to cause sweating whereas the resinous preparations are “esteemed good for the gout and dropsy, the King’s evil¹ and particularly for the French pox”, Gerard (*The Herbal*, 1633) also considered it to be of use in asthma, epilepsy, diseases of the bladder, flatulence, crudities and all chronic disease stemming from cold and moist causes. Guaiacum wood, when first imported into the U.K. fetched as much as seven old crowns a pound.



Guaiacum officinale (a) flowering branchlet, $\times 2/3$. (h) twig with fruit, and dehiscent fruit, $\times 2/3$ from Correll 1982, *Flora of the Bahama Archipelago*.

Today the hard resin or gum guaiacum (extracted by making incisions in the trunk or by heating up billets of wood in a fire and collecting it in a receptacle or by boiling chips or raspings in water with common salt) is often dissolved in rum or gin and used as a gargle for sore throats or as a painkiller for stomach and intestinal aches. Extracts of the bark are said to be good for rheumatism, intermittent fevers and chronic skin disorders (especially in scrofulous or syphilitic subjects). Extracts of both wood and flowers act as a laxative and boiled leaves are still apparently used in some parts of the West Indies for abortions and arthritis, while the bark of the related species *G. sanctum* L. is boiled with the bark of *Bursera simaruba* (L.)² to cure weakness in men!! In this country you can obtain guaiacum lozenges (Plummer’s Pills) for the treatment of sore throats,

¹King’s-evil = scrofula or chronic enlargement of the lymph glands. Samuel Johnson was a sufferer.

²Linnaeus recommended the use of extracts of *Pistacia simaruba* L. for the treatment of diarrhoea—*Materia Medica*: 535, but early herbals claim that *P. simaruba* yields a balsam which is very vulnerary and healing.

acute tonsillitis and rheumatism, and ammoniated tincture of guaiacum (*mistura guaiaci*) for skin disorders, gout and other forms of chronic arthritis; similarly the alcoholic tincture is a useful remedy for arthritic dialthesis—particularly of the hands; it is also still widely used in proprietary medicines as an expectorant.

Lignum vitae is one of the hardest and heaviest commercial timbers (even when dry it sinks in water—specific gravity 1.333) remarkable for the fact that each layer of fibres crosses the preceding diagonally and in the deposition of large quantities of resinous matter. It is this resin which imparts to the wood the very valuable quality of being self-lubricating making it extremely resistant to friction and abrasion. Thus the wood is widely used for lining propeller shafts of ships and for blocks, pulley sheaves bearings and for pestles, bowling balls, rulers, mallets etc. It is also used extensively in turnery and in the past furnished many of the cogs and wheels of the sugar mills.

The chief constituents of the wood are three distinct resins—guaiaconic acid (α and β), guaiacic acid (closely allied to benzoic acid) and guaiaretic acid. Also present are vanillin, guaiacasaponin and a higher terpenoid—guaiaгутtin. Distillation of the wood yields methyl catechol (guaiacol).

Sloan (1725) noted that the foliage is very deterrentive and is frequently used to scour and whiten the floors in most houses about Kingston, but he also records that infusions of the leaves may be used to wash stained garments without fear of the dyes running.

Guaiacum officinale L. is now placed in the Zygophyllaceae, a small family of some 27 genera and 250 species. The family, which is widely distributed in the New World tropics and drier subtropics, is said to contain a number of relict genera and is presumed to be related to the Rutaceae. According to Sloane (ms) *G. officinale* L. was first cultivated (from seed) in this country by the Duchess of Beaufort in her stove house in Gloucestershire in 1699. Since that time it has been extensively introduced into the Old World Tropics as well as many European, temperate greenhouses. Today it is greatly esteemed as an ornamental tree, able to withstand dry conditions and exposure to sun and wind, ideal for planting near to the sea in frost-free, warm climates.

B.G.G.

REFERENCE

- SLOANE, H., 1725. *A Voyage to the Islands Madera, Barbados, Nieves, S. Christophers and Jamaica with the Natural History of the Herbs and Trees, Four-Footed Beasts, Fishes, Birds, Insects, Reptiles, etc. of the Last of those Islands* (2 vols, folio, 1707, 1726).

Library

The reading Room at the moment has three small gaps on the walls where we have lent some plaster bas-reliefs for an exhibition of work on Pre-Raphaelite sculpture. The portrait medallion of Thomas Bell, by J. L. Tupper and those of James Clark Ross and John Richardson by Bernhard Smith are currently on exhibit in the Matthiesen Galley, Mason's Yard, just off Duke Street. They will be at the Birmingham Museum and Art Gallery from 15 January to 15 March.

1992. Adam Sedgwick and Charles Darwin are other naturalists also on exhibit. Tupper's sculpture of Linnaeus in Lappland dress is on the outside of the University Museum, Oxford.

By the time this is published, we should have made further progress with reshelving the remainder of the oversize British journals, with help from a student just before Christmas. At the moment the Library annexe is still piled high with the backlog of accessions for cataloguing, to which a large number of genetics and evolutionary biology books have been added, donated by Prof. R. J. Berry. Some will go into the Library, others will be in the Book Sale. As we are still sorting them out they are not listed in the donations given here but will appear at a later date.

Two recent visitors to the Society have made particularly notable contributions to the Library. The first was the Ambassador for Brazil, who came to the Society for the General Meeting on 14th November at which Prof. G. Prance talked about the ethnobotany of the Amazon Indians. The Ambassador made a most welcome presentation of the results of the Langsdorff Expedition to Brasil (1821–1829). These three volumes contain magnificent colour illustrations of the natural history of Brazil, reproduced from the original drawings held as part of the collections in The Russian Science Academy Archives, St Petersburg. We were pleased to have news, shortly after the Ambassador's visit, of new steps for demarcation of land for the indigenous peoples of Brazil. Our next visitor was Prof. N. N. Vorontsov, from the Ministry of Environmental Protection of the U.S.S.R. He presented us with the works listed below which include two volumes on nature reserves. We were able to show him correspondence between naturalists in Moscow and St Petersburg with Linnaeus and specimens collected in Siberia now in the Linnaean Herbarium. He was glad to find that we already held his own contribution to the Fauna of the U.S.S.R. (Vol. 3(1) 1982, on the Voles), and added his signature.

Other donations are listed below, excluding gifts of back issues of natural history journals from R. Fitter, P. Sowan and others, for which we are also most grateful.

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|------------------------|--|
| Academic Press | da Vinci, Leonardo, <i>Drawings by Leonardo da Vinci, the Queen's collection at Windsor. I Landscapes, plants and water studies, edited by Carlo Pedretti</i> . 239 pp. 70 pl., London, Academic Press/Johnson Reprint, 1982. |
| Dr S. I. Ali | Ali, S. I. & Nasir, Y. I. <i>Flora of Pakistan, No. 191, Boraginaceae</i> . 200 pp. illustr., map, Islamabad, Pakistan Agricultural Research Council, 1989. |
| F. W. G. Baker | Di Castri, F., Baker, F. W. G. & Hadley, Malcolm, <i>Ecology in Practice, part 1 Ecosystem management, part 2 The social response</i> . 2 vols, 542 & 396 pp., illustr., maps, Dublin & Paris, Tycooly International Publ. & UNESCO, 1984. |
| Brazil, Ambassador of, | [Langsdorff, Grigori Ivanovich,] <i>Expedicao Langsdorff a Brasil 1821–1829 [edited by Salvador Monteiro and Leonel Kaz]</i> . 3 vols., col. illustr., maps, Rio de Janeiro, Ed. Alumbamento, 1988. |
| J. A. Burton | Burton, John A. <i>Snakes, an illustrated guide</i> . 144 pp. col. illustr., London, Blandford, 1991. |

- Cambridge University Press Century Hairston, Nelson G., *Ecological experiments, purpose, design and execution*. 370 pp. Cambridge, CUP, 1989.
 Fassett, Kaffe, *Glorious inspiration, Kaffe Fassett's needlepoint source book*. 192 pp. col. illustr., London. Random Century, 1991.
- Chapman & Hall TeBeest, David O. *Microbial control of weeds*. 284 pp. London, Chapman & Hall, 1991.
- Lord Cranbrook Cranbrook, Earl of, *Mammals of south-east Asia*. (2nd ed.) 96 pp. illustr. some col., maps, Singapore, CUP, 1991.
- Dr L. M. Derrick Davis, Joel, *Mapping the code, the human genome project*. 294 pp. illustr., New York, J. Wiley, 1990.
- G. L. Douglas Schumacher, E. E. *Small is beautiful*. 255 pp. London, Abacus, 1977.
- Dr J. Feltwell Feltwell, J. *Beekeeping, a practical guide to beekeeping in school grounds*. 18 pp. illustr. some col., Winchester, Learning through Landscapes, 1990.
 Feltwell, J., *Butterflies, a practical guide to their study in school grounds*. 20 pp. illustr. some col., Loughborough, Learning through Landscapes, 1990.
 Feltwell, J. *Slugs, snails and earthworms, a practical guide to their study in school grounds*. 22 pp. illustr. some col., Winchester, Learning through Landscapes, 1991.
- Dr R. Garilleti Cavanilles, A. J., *Hortus Regius Matritensis* . . . 50 pp. 100 pl. [unbound] Madrid, Fareso S.A. 1991
- Geological Society Lobin, Wolfram, *Beitrag zur fauna und flora der Kapverdischen Inseln. (Corr. Forsch. Inst. Senkenberg, No. 129)*. 196 pp. illustr. map, Frankfurt, 1990.
- B. Harley Emmet, A., Maitland, *The scientific names of the British Lepidoptera, their history and meaning*. 288 pp. Colchester, Harley Books, 1991.
- Dr B. Holzmann Holzmann, Bruno, *Eduard Strasburger, sein leben, sein zeit und sein werk (Thesis)*. 276 pp. illustr., Frankfurt am Main, 1967.
- Dr S. L. Jury Bangladesh Agricultural Research Council, *Flora of Bangladesh: pts. 13, Buddlejaceae, 16, Zygophyllaceae 18, Avertrhoaceae and Salicaceae. Edited by M. D. Sular Khan*. Dacca, Bangladesh Nat. Herbarium, 1980-82.
 IZMIR, Ege University, *Section of Botany, Science Faculty publication ser. Vol. 7. Professor Dr. Yusuf Vardar commemorative volume (bound up "reprints" by former students and colleagues)* unpagged, Izmir, 1984.
 Sociedade Botanica do Brasil, *Anais, XV Congresso Nacional de Botanica*. 451 pp. illustr., Porto Alegre, Graf. da Univ. Fed., 1967.
 Sociedade Botanica do Brasil, *Index dos Trabalhos apresentados nos congressos annais da Sociedade Botanica do Brasil (by Ezechias P. Heringer) (Suppl. 1, Anos 1966, 1967 & 1968)*. 16 pp. Fortaleza, Ceara, 1968.
 Sociedade Botanica do Brasil, *Anais, XXIII Congresso*

- Nacional de Botanica*, 1972. 329 pp. illustr., maps, Recife, 1973.
- Sociedade Botanica do Brasil, *Anais, XXV Congresso Nacional de Botanica, Morovo*. 394 pp. illustr., Recife, Univ., Fed. de Pernambuco, 1976.
- Sociedade Botanica do Brasil, *Traballos do XXVI Congresso Nacional, Rio de Janeiro, 1975*. 633 pp. illustr., maps, Rio de Janeiro, Acad. Brasil. de Ciencias, 1977.
- T. E. L. Langford Langford, T. E. L., *Ecological effects of thermal discharges*. 468 pp. illustr., London, Elsevier, 1990.
- Sir Christopher Lever Nature Conservancy Council, Britain's birds in 1989–1990, the conservation and monitoring review. 216 pp. illustr., Thetford, BTO, 1991.
- W. H. Lewis Lewis, Walter H., Vinay, Prathibha & Zenger, Vincent E. *Airborne and allergic pollen of North America*. 254 pp. illustr., maps, Baltimore, Johns Hopkins University Press, 1983.
- Dr D. J. Mabberley Mabberley, David J. *Tropical rain forest ecology (2nd ed.)*, 300 pp. illustr. maps, Glasgow, Blackie, 1992.
- J. G. Maisey Maisey, J. G. *Santana fossils, an illustrated atlas*. 459 pp. illustr. some col., maps, Neptune City, TFH publications, 1991.
- Oxford University Press Shorrocks, Bryan & Swingland, Ian R., eds. *Living in a patchy environment*. 246 pp. illustr., Oxford, OUP, 1990.
- Dr M. J. Plotkin Wolpert, Lewis, *The triumph of the embryo*. 211 pp. illustr., Oxford, OUP, 1991.
- RBG, Kew Plotkin, M. J., Boom, Brian M. & Allison, Malorye, *The ethnobotany of Aublet's Histoire des Plantes de la Guiane Francoise (1775)*. (Monogr. in Syst. Bot. Missouri Bot. Gdn., Vol. 35) 108 pp. illustr., St. Louis, Missouri Bot. Garden, 1991.
- Victoria Roberts [Jackson, Benjamin Daydon], *Index Kewensis Suppl. XIX, 1986–90, compiled by R. A. Davis and K. M. Lloyd*. 354 pp. Oxford, Clarendon Press, 1991.
- Birkbeck, Alan, *Wildfowl at home*. 64, pp., illustr. some col., Evesham, Domestic Fowl Trust, 1991.
- Roberts, Michael & Roberts, Victoria, *Bantams in colour*. 48 pp., col. illustr., Evesham, Domestic Fowl Trust, 1984.
- Roberts, Michael & Roberts, Victoria, *Domestic duck and geese in colour*. 40 pp., col illustr., Evesham, Domestic Fowl Trust, 1986.
- Roberts, Michael & Roberts, Victoria, *Modern free range*. 54 pp. illustr., Evesham, Domestic Fowl Trust, 1988.
- Roberts, Michael & Roberts, Victoria, *Chickens at home*. 54 pp. illustr., Evesham, Domestic Fowl Trust, 1989.
- Roberts, Michael & Roberts, Victoria, *Turkeys at home*. 58 pp. illustr., some col., Evesham, Domestic Fowl Trust, 1989.
- Roberts, Michael & Roberts, Victoria, *Ducks and geese at home*. 53 pp. illustr., Evesham, Domestic Fowl Trust, 1991.

- F. Rosengarten Rosengarten, Frederic, *Wilson Popenoe, agricultural explorer, educator and friend of Latin America*. 182 pp. illustr., Hawaii, Nat. Tropical Bot. Gdn., 1991.
- Prof. R. E. Schultes Riedlinger, T. J., ed. *The sacred mushroom seeker, essays for R. Gordon Wasson, foreword by R. E. Schultes*. 283 pp. illustr. some col., maps, Portland, Dioscorides Press, 1990.
Schultes, R. E., Gentry, A., Uribe, C. C. & Alberico, M. *Selva humeda de Colombia*. 198 pp. col. illustr., Bogota, Villegas, 1990.
- Smithsonian Institution Viola, Herman J. & Margolis, Carolyn, eds. *Seeds of change, a quincennial commemoration*. 278 pp. col. illustr., Washington, Smithsonian Institution Press, 1991.
- Studio Editions Evans, Mark, *Herbal plants, history and uses*. 143 pp. illustr. some col., London, Studio Editions, 1991.
- Dr R. L. Taylor CHICAGO, Botanic Garden, *A garden for all seasons*. 123 pp. (+16) col. illustr., Glencoe, Ill., Chicago Horticultural Society, 1990.
- P. Tuley Cock, James, MacIntyre, Reginald & Graham, Michael, eds. *Proceedings, 4th Symposium, International Society for Tropical Root Crops*, 277 pp. Ghana, Int. Dev. Res. Centre, 1977.
Dempsey, James M. *Fiber crops*. 457 pp. illustr., Gainesville, University Presses of Florida, 1975.
Hall, H. T. B., *Diseases and parasites of livestock in the tropics*. 288 pp. illustr., London, Longmans, 1977.
Innes, R. Rose, *A manual of Ghana grasses*. 265 pp. illustr., map, Surbiton, Min. Overseas Dev., Land Resources Div., 1977.
KUALA LUMPUR, Rubber Research Inst. of Malaya, *Replantation on small holdings*. 58 pp. illustr., Kuala Lumpur, Caxton Press, 1957.
MANILLA, International Rice Research Institute, *Economic consequences of the new rice technology*. 402 pp. maps, Manilla, IRRI, 1978.
Moreton, B. D. *Beneficial insects and mites*. 118 pp. 8 col. pl., London, HMSO, 1969.
Spurgeon, David, *Hidden harvest, a system approach to post harvest technology*. 36 pp. illustr., Ottawa, IPRC, 1976.
WASHINGTON, National Academy of Sciences, *Underexploited tropical plants with promising economic value*. 189 pp. illustr., Washington, Nat. Academy of Sci., 1975.
- J. C. von Vaupel-Klein Vaupel-Klein, Jan Carl von, *Monograph of Euchirella*. 510 pp. illustr., maps, Leiden, Brill, 1984.
- Prof. N. N. Vorontsov [MOSCOW, Gosudarstvennii Komitet SSSR po ochrane prirodi] *[Sostoyanie prirodnoi sredi v SSSR v 1988 godu]*. 171 pp. Moscow, 1990.
Sokolova, V. V. & Siroechkovskogo, E. E. eds. *[Zapovedniki SSSR: Europeichkoi chasti RSFSR, II]*. 303 pp. col. illustr., map, Moscow, Misli, 1989.

- Sokolova, V. V. & Siroechkovskogo, E. E. eds. [*Žapovedniki SSSR: Srednei Azii i Kazakstana*]. 400 pp. col. illustr., map, Moscow, Misli, 1990.
- Prof. D. A. Webb Giacomini, Valerio, *Il paesaggio Vegetale della Provincia di Sondrio*. (Monografie sulla Flora e Vegetazione d'Italia, Mem. No. 3) 132 pp. Milan, Gianasso, 1960.
- Gorchakov, P. (and others), [*Žapiski Sverdlovskogo otdelenija vsesojuznogo botanicheskogo obshchestva*] 112 pp., Sverdlovsk, 1960.
- Greuter, Werner & Rechinger, Karl Heinz, *Chloris Kythera*. (Flora of the island of Kythera) Boissiera: Vol. 13. 206 pp. illustr. maps, Geneva, Conservatoire et Jardin Botanique, 1967.
- Luis, I. T. O. *botanica Lassalista F. Sennen*. 125 pp. Rio Grande do Sul, 1961.
- Pirola, Augusto, *Flora e vegetazione periglaciale . . .* (Monogr. Flora e Vegetazione Italia, Mem. No. 1) 114 pp. illustr. maps, Milan, Gianasso, 1959.
- Rothmaler, Werner, *Allgemeine taxonomie und Chorologie der Pflanzen* (2nd ed.). 215 pp. illustr. maps, Jena, Gronau, 1950.
- Skvortsov, A. K. [*Gerbarii: pocobie po metodike i tehnike.*] 198 pp. illustr., Moscow, Nauka, 1977.
- Voroshilov, V. N., Skvortsov, A. K. & Tihomirov, V. N. [*Opredelitel'i rastenij Moskovskoj oblasti.*] 365 pp. illustr., Moscow, Nauka, 1966.

Accessions

- Atkinson, R. R., *Jute: fibre to yarn*. 212 pp. illustr., London, Temple Press, 1964.
- Baas, Pieter, Kalkman, Kees, & Geesink, Rob, eds. *The plant diversity of Malesia: proceedings of the Flora Malesiana symposium. . .* 420 pp. illustr., maps, Dordrecht, Kluwer, 1990.
- Beattie, Owen & Geiger, John, *Frozen in time, the fate of the Franklin expedition*. 179 pp. col. illustr. map, London, Grafton, 1987.
- Blackburn, Julia, *Charles Waterton, traveller and conservationist*. 243 pp. illustr., London, Bodley Head, 1989.
- British Museum, (Natural History) [Insecta, Lepidoptera] *Generic names of moths of the world, Vol. 6: Microlepidoptera by I. W. E. Nye and D. S. Fletcher*. 368 pp. London, Natural History Museum, 1991.
- Burrows, Elsie M., *Seaweeds of the British Isles, Vol. 2 Chlorophyta*. 238 pp. illustr. London, Natural History Museum, 1991.
- Campbell, Olwen, *Mary Kingsley, a Victorian in the jungle*. 196 pp. illustr., London, Methuen, 1957.
- Carter, Paul, *The road to Botany Bay, an essay in spatial history*. 384 pp. illustr., maps, London, Faber & Faber, 1987.
- Cayley, Neville W., *What bird is that: a guide to the birds of Australia*. 344 pp. col. illustr., Sydney, Angus & Robertson, 1961.

- Cheesman, Evelyn, *Six legged snakes in New Guinea . . . a collecting expedition*. 281 pp. illustr., maps, London, G. L. Harrap, 1949.
- Clutton-Brock, Juliet, *The walking larder, patterns of domestication, pastoralism and predation*. 368 pp. illustr., maps, London, Unwin Hyman, 1990.
- Collenette, Sheila, *An illustrated guide to the flowers of Saudi Arabia*. 514 pp. col. illustr., maps, Buckhurst Hill, Scorpion, 1985.
- Darlington, C. D., *The evolution of man and society*. 753 pp. London, George Allen, 1969.
- Dawood, Richard, *Traveller's health, how to stay healthy abroad (2nd ed.)*. 581 pp. illustr., Oxford, OUP, 1989.
- Desmond, Adrian & Moore, James, *Darwin*. 808 pp. illustr., London, Michael Joseph, 1991.
- Fabre, J. H., *The wonders of instinct, chapters in the psychology of insects translated . . .* 317 pp. illustr., London, Fisher Unwin, 1919.
- Fernando-Cruz, M., ed. *Situacion de la avifauna de la Peninsula Iberica, Baleares y Macaronesia*. 207 pp. illustr., map, Madrid, CODA-SEO, 1985.
- Gerbi, Antonello, *Nature in the New World*. 462 pp., Pittsburgh, Univ. Pittsburgh Press, 1985.
- Gomez-Pompa, A., Whitmore, T. C. & Hadley, N. J., eds. *Rainforest regeneration and management. (Man and Biosphere Series)* 457 pp. illustr., maps, Paris & Carnforth, UNESCO & Parthenon, 1991.
- Gosse, P. *The squire of Walton Hall*. 324 pp. illustr. maps, London, Cassell, 1940.
- Gould, S. J., *Wonderful life, the Burgess shale and the nature of history*. 347 pp. illustr., London, Penguin, 1991.
- Crafen, Alan, ed. *Evolution and its influence (Herbert Spencer lectures 1986)*. 130 pp. illustr., Oxford, Clarendon Press, 1989.
- Griffiths, Sir Percival, *The history of the Indian tea industry*. 730 pp. illustr., London, Weidenfeld & Nicolson, 1967.
- Hawksworth, D. L., ed. *Improving the stability of names: needs and options. Proceedings of a conference. . .* 358 pp. 2 illustr. Königstein, Koeltz, 1991.
- Hayward, P. J. & Ryland, J. S., *The marine fauna of the British Isles and North West Europe*. 2 vols. 996 pp., illustr. maps, Oxford, Clarendon Press, 1990.
- Hegi, Gustav, ed. *Illustrierte Flora von Mitteleuropa*. multiple vols., illustr. some col., Berlin, Paul Parey.
- Hyams, Edward, *Animals in the service of man, 10,000 years of domestication*. 209 pp. illustr., London, J. M. Dent, 1972.
- Indian Tea Association, Scientific Dept., *Tea encyclopaedia (looseleaf entries in binder)*. unpagged, Tocklai, Indian Tea Association, 1947–1954.
- Jackson, Christine E., *Bird Etchings, their illustrators and their books, 1655–1855*. 292 pp. illustr., 4 col. pl., Ithaca, Cornell University Press, 1985.
- James, Helen F. & Olson, S. L., *Descriptions of 32 new species of birds from the Hawaiian Islands, Pt. 1, non-Passeriformes, pt 2, Passeriformes. (AOU ornithol. monog. no. 25)* 88 pp. & 88 pp. illustr., maps, Washington, American Ornithological Union, 1991.
- Jobling, James, *A dictionary of scientific bird names*. 272 pp. illustr., Oxford, OUP, 1991.
- Lincoln, R. J. & Boxshall, G. A., eds., *The Cambridge illustrated dictionary of natural history*. 413 pp. illustr., map, Cambridge, CUP, 1987.
- Lord, John, *Duty, honour and empire, the life and times of Colonel Richard Meinertzhagen*. 412 pp., illustr., London, Hutchinson, 1971.

- Markham, A. H., *Life of Sir John Franklin and the N.W. passage*. 324 pp. illustr. maps, London, Phillips, n.d.
- Moore, N. W., *The bird of time, the science and politics of nature conservation, a personal account*. 290 pp. illustr., Cambridge, CUP, 1987.
- Munz, P. A., *California spring flowers*. 122 pp. illustr. maps, Berkeley, Univ. California Press, 1961.
- Pascher, A., *Süßwasserflora von Mitteleuropa, Bacillariophyceae 4 (2/4) by K. Kramer & H. Lange-Bertelot*. 437 pp. illustr., Stuttgart, Fischer, 1991.
- Reid, J. M., *Traveller extraordinary, the life of James Bruce of Kinnaird*. 320 pp. illustr. maps, London, Eyre and Spottiswoode, 1968.
- Ritvo, Harriet, *The animal estate, the English and other creatures in the Victorian age*. 347 pp. illustr., Cambridge Mass., Harvard University Press, 1987.
- Rohde, Eleanor Sinclear, *A garden of herbs*. 300 pp. illustr., London, H. Jenkins, n.d.
- Ryder, Michael L., *Animal bones in archaeology, a book of notes and drawings for beginners*. 65 pp. illustr., Oxford, Blackwells, for the Mammal Society, 1969.
- Sarjeant, William A. S., *Geologists and the history of geology, an international bibliography*. 5 vols., New York, Arno Press, 1980.
- Shepherd, Winsome & Cook, Walter, *The Botanic garden, Wellington, a New Zealand history 1840-1987*. 396 pp. illustr. 2 col. portraits, maps, Wellington, Millwood Press, 1988.
- Sibley, Charles G. & Ahlquist, Jon L., *Phylogeny and classification of birds*. 976 pp. diagr., New Haven, Yale University Press, 1990.
- Sibley, Charles G. & Monroe, Burt J., *Distribution and taxonomy of birds of the world*. 1111 pp. maps, New Haven, Yale University Press, 1990.
- Stancovic, S., *The Balkan Lake Ohrid and its living world (Monographiae Biol. IX)*. 357 pp. illustr., maps, The Hague, Junk, 1960.
- Thomas, John M., *Michael Faraday and the Royal Institution (the genius of man and place)*. 234 pp. illustr., Bristol, Hilger, 1991.
- Tomlinson, P. E., *The botany of mangroves*. 413 pp. illustr., maps, Cambridge, CUP, 1986.
- Topsell, Edward, *The fowles of heaven or history of birds . . .* 332 pp. col. illustr., Austin, Univ. of Texas Press, 1972.
- Turner, Dennis C. & Bateson, Patricia, eds., *The domestic cat, the biology of its behaviour*. 222 pp. illustr., Cambridge, CUP, 1988.
- Vigueras, Louis-Andre, *The discovery of South America and the Andalusian voyages*. 170 pp. maps, Chicago, University of Chicago Press, 1976.
- Vulliamy, C. E., *Aspasia, the life and letters of Mary Granville, Mrs Delany (1700-1788)*. 289 pp. illustr., London, Geoffrey Bles, 1969.
- Waddington, C. H., *An introduction to modern genetics*. 441 pp. illustr., London, Allen & Unwin, 1939.
- Webb, D. A. & Gornall, R. J., *Saxifrages of Europe . . .* 307 pp. illustr. some col., maps, London, C. Helm, 1989.
- White, Gilbert, *The journals of Gilbert White Vol. 3 1784-1793, edited by Francesca Greenoak*. 496 pp. illustr. London, Century, 1989.
- Whitmore, T. C., *An introduction to tropical rain forests*. 226 pp. illustr. maps, Oxford, Clarendon Press, 1990.
- Wright, Sewall, *Evolution and the genetics of populations, a treatise in 3 volumes. Vol. 1. Genetic and biometric foundations*. 469 pp. Chicago, University of Chicago Press, 1968.

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Desertified Grasslands

In February last year the Linnean Society with Wye College sponsored an International Symposium, the Proceedings of which are to be published in February 1992 as "Desertified Grasslands, their Biology and Management", editor G. P. Chapman, Academic Press.

A result of the meeting was the formation of the International Committee for the Improvement of Arid Environments. The objectives include linking the large UK and French data bases on plants of arid and semi-arid regions, encouraging the exchange of scientific personnel among various research organizations particularly with those located in the Saharan region, and raising awareness among the funding agencies for work in this area.

Further details of the committee's work can be had from:

Dr G. P. Chapman
Wye College
University of London
Ashford
Kent TN25 5AH.

Molluscan Conservation

There will be an International Conference on Molluscan Conservation in Glasgow on 9–12 September 1992. Further details can be obtained from Ms Maggie Riley, Department of Zoology, Museum, University of Glasgow, Glasgow G12 8QQ.

January Linnean

It appears that some difficulties arose in the distribution of the January *Linnean*, for which we apologise. Any members who have not received a January *Linnean* and who would like to receive one should contact the office of the Society.