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THE LINNEAN

Newsletter and Proceedings of the Linnean Society of London

Edited by B. G. Gardiner

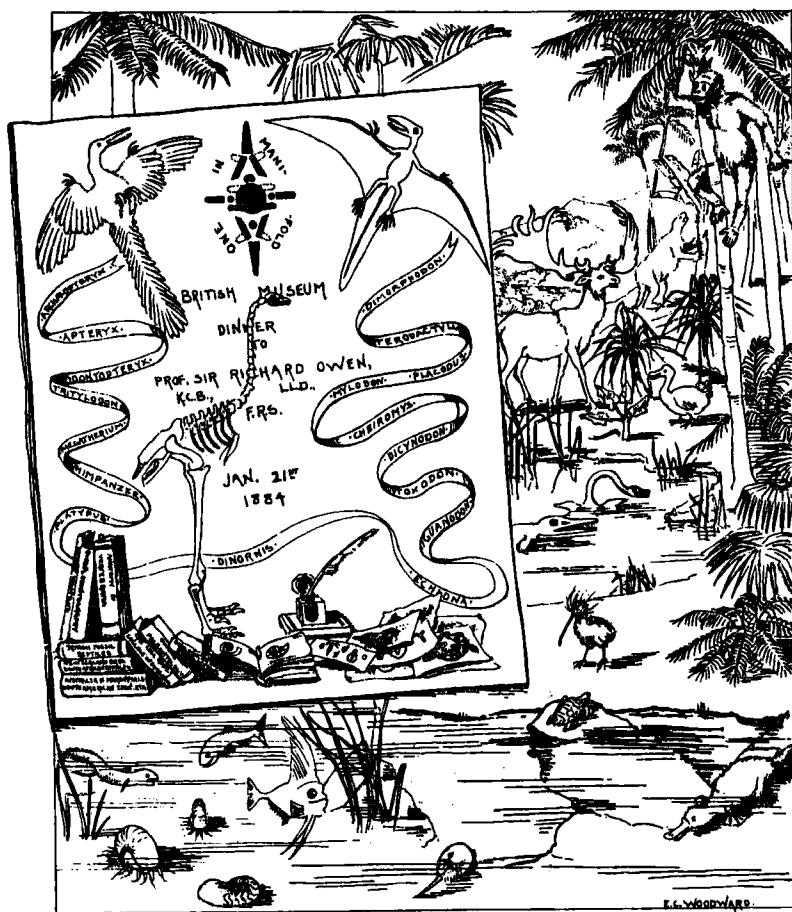
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Editorial

Since we last went to press there has been the dramatic end of Communist rule in the Soviet Union. Less than a month before the coup a private American foundation sent a delegation on Infectious Diseases to Leningrad and Moscow.

This issue contains an article on the state of Soviet medicine by a member of that delegation who was surprised to find that AIDS did not appear to be a significant problem in Russia.

Last year we celebrated the 150th anniversary of the naming of the dinosaurs. This year we commemorate the death of Richard Owen 100 years ago (Sunday November 20, 1892). Owen retired as Superintendent (annual salary £800) of the Natural History Departments of the British Museum in December 1883 but returned the following month to attend a stupendous dinner held in his honour. All that remains of that occasion is the elegant announcement drawn by E. C. Woodward (see below) depicting his celebrated archetype theory and the



animals on which he had worked. Clearly Miss Woodward did not consider Owen's dinosaurs to be of any real importance since only *Iguanodon* is even mentioned. However, since today Owen is remembered mainly for his dinosaurs and by some for his influential advocacy that led to the creation of the Natural History Museum, we publish as a tribute to him a poem by Ogden Nash taken

from his book *I wouldn't have missed it* by kind permission of the publishers Andre Deutsch Ltd, Great Russell Street, London WC1B 3LJ.

NEXT!

I thought that I would like to see
 The early world that used to be,
 That mastodonic mausoleum,
 The Natural History Museum,
 On iron seat in marble bower,
 I slumbered through the closing hour.
 At midnight in the vasty hall
 The fossils gathered for a ball.
 High above notices and bulletins
 Loomed up the Mesozoic skeletons.
 Aroused by who knows what elixirs,
 They ground along like concrete mixers.
 They bowed and scraped in reptile pleasure,
 And then began to tread the measure.
 There were no drums or saxophones,
 But just the clatter of their bones,
 A rolling, rattling, carefree circus
 Of mammoth polkas and mazurkas.
 Pterodactyls and brontosauruses
 Sang ghostly prehistoric choruses.
 Amid the megalosauric wassail
 I caught the eye of one small fossil.
 Cheer up, old man, he said, and winked—
 It's kind of fun to be extinct.

This issue also includes the verbal statement made by the President to the House of Lords Sub-Committee on Systematic Biology Research, as well as two short articles on the conservation of biodiversity. The theme of biodiversity is continued with the announcement of a forthcoming meeting concerned with systematics and conservation.

SOCIETY NEWS

Notes

This time last year we were recovering from the external cleaning. This has now been completed with the redecoration of the Library annexe. For those interested, it took four men ten days, and the results are magnificent.

The celebration of Prof. W. T. Stearn's 80th birthday took place a month after the actual date and involved three societies, in two locations. The Royal Horticultural Society, the Society for the History of Natural History and the Linnean Society co-sponsored an international gathering which opened at the Royal Horticultural Society and closed at the Linnean Society and included papers on many of the themes known to be of special interest to Professor Stearn. A formal dinner at the Royal Horticultural Society gave Robin Herbert,

President, a chance to inform us of the length and breadth of Professor Stearn's career to which Professor Stearn was able to add his comments. A glass bowl, engraved by Margaret Desmond with plants associated with Professor Stearn, was presented on behalf of all involved. The sessions at the Linnean Society focused more on taxonomic aspects and closed with a buffet supper, also attended by members of the Society for the History of Natural History, of which Professor Stearn was a Founder Member. A breath of fresh air between the two locations was provided by the Staff of Chelsea Physic Garden who welcomed participants and arranged for a display of items from the Library. The papers from the meeting will be published as a special issue of the *Botanical Journal of the Linnean Society*.

Unusually, the Society held two meetings in July. The first, jointly with the Systematics Association on 11 July, was on *Taxonomic Research and its Applications: Problems and Priorities*. It was held at the Royal Society, which supported the meeting, and it attracted 175 participants, who heard ten excellent presentations, the summaries of which the Society hopes to publish as a booklet to provide informed comment on this important area. The meeting was generously supported also by the Annals of Botany Company (£1250) and Imperial Chemical Industries (£500).

On 22–24 July, the Society hosted a three-day European consultation on a *Biodiversity Conservation Strategy and Action Plan*, a document produced jointly by the International Union for the Conservation of Nature, the United Nations Environment Programme and the World Resources Institute in May 1991. A report of this meeting appears elsewhere in these pages. The organizers of the meeting are grateful to the Danish and U.K. Governments, who provided money to bring 12 Eastern European delegates to the consultation, and to the European Commission, which gave generous and more general support.

Cardiff 1991

Over 100 delegates gathered in Cardiff on 24–26 September to hear and discuss 'Evolutionary Patterns and Processes'. The President, Professor Hawkes, and his predecessor, Professor Claridge, at whose invitation the Society had come to Cardiff, welcomed delegates and the scientific proceedings were opened with Professor Stephen J. Gould (Harvard) reminiscing on 20 years of punctuated equilibrium. The meeting concluded two and a half days later with Professor T. K. Wood (Delaware) on speciation in tree hoppers and the intervening gap was filled by some 20 speakers from as far afield as Queensland and Michigan.

A Society General meeting saw the admission of Professor H. E. H. Paterson as a Foreign Member and five others—Dr Griffiths, Professor Harper, Dr Lees and Dr Wilkins (all from Cardiff) and Professor Parsons (Adelaide) as Fellows. The Society's Council also met during the meeting.

Local organizers for the Linnean Society were Dr Dianne Edwards and Professor Michael Claridge, who were assisted by numerous of their colleagues in making a great success of the meeting. To all these in the Dept of Geology, the School of Pure and Applied Biology and the National Museum of Wales, the Society owes a considerable debt for an excellent scientific and social occasion.

The proceedings of the meeting will be published by the Society.

Publications

Two of the Society's editors are in the involved process of handing on their responsibilities. It is worth noting that the Society's publications generate much of its income, and that the Society's books and journals are held in the highest esteem throughout the world. It is a pleasure, therefore, to recognize and thank Drs Stephen Jury and Doris Kermack for their editorships of many years, of the Botanical Journal and the Synopses of British Fauna respectively. Dr Kermack's valued services to the Society were recognized by the unique award of a gold medal on the occasion of the Society's Bicentenary. The new editor of the Botanical Journal will be Dr Dianne Edwards, of the University College of Wales at Cardiff, and of the Synopses, Dr John Crothers, of the Leonard Wills Field Centre at Taunton.

Stamps

The Society's Bicentenary was marked *inter alia* by the issue of a set of U.K. stamps. Members will be sad to learn that the designer of these stamps, Mr Ted Hughes, of Marden in Kent, died in August. A message of sympathy has been sent to his widow. The recipient of the 1987 H.H. Bloomer Award, Mr Malcolm C. Clark, of Birmingham, has also died.

Donation

Under the will of Dr Charles Russell Metcalfe, who died in June, the Society received £250 for which it is most grateful. Dr Metcalfe was the 1971 recipient of the Linnean Medal for Botany.

Meetings

Although only a few of the Society's meetings attract attention in these pages, this does not mean that other meetings are of lesser value. Fellows of the Society put in inordinate amounts of work, ably supported by the Society's staff, to ensure their success. This summer, two van loads of meetings material were distributed with the August issue of this journal; at the time of writing (August) eight meetings are at an advanced state of preparation for 1992/93. Those for which dates have been agreed are:

Patterns and Process: Phylogenetic Approaches to Ecological Problems
at the Natural History Museum, 1/2 September 1992. Dr Paul Eggleton, Natural History Museum, Cromwell Road, London SW7 5BD (with the Natural History Msueum).

Shape and Form in Plants and Fungi Annual Regional Meeting, Edinburgh,
1/2 October 1992. Dr David Ingram, Royal Botanic Garden, Edinburgh EH3 5LR. **Please note the change of date from that in the published programme of Society meetings.**

The Impact of Global Changes on Diseases *at the Royal College of Physicians,*
30 September 1992. Dr Gordon Cook, 11 Old London Road, St. Albans, Herts AL1 1QE (with the British Society for Parasitology and the Royal Society of Tropical Medicine and Hygiene).

Classification of Monocotyledons at Kew, 18/23 July 1993. Dr Chris Humphries, Natural History Museum, Cromwell Road, London SW7 5BD (with the Royal Botanic Gardens, Kew and the Systematics Association).

The Society is greatly indebted to all those who make such a substantial contribution to all its meetings. The Programmes Committee, which coordinates them all, is grateful to receive suggestions from members for future meetings.

The Institute of Biology is organizing a meeting on **Biology in Europe after 1992** at Southampton University on 2/3 April 1992. Speakers include Professors Fasella (Director-General, DG XII of the Commission for the European Communities), Stewart (Cabinet Office) and Phillips (ABRC). Further details from the Scientific Services Department, Institute of Biology, 20 Queensberry Place, London SW7 2DZ (071 583 8333).

Educational Programme for Schools and Colleges. At this time of educational change the biological sciences need to maintain a high profile in schools. The Society has a part to play amongst VIth Form Students and their teachers by stimulating interest in biology and broadening knowledge. Fellows based in higher education outside London are invited to widen the Society's educational programme by organizing one-day events (symposia and workshops) or evening lectures for A-level biology students of local schools. Mailing facilities and the fee for one speaker can be provided by the Society. Please contact the Executive Secretary in the first instance if you have any suggestions.

Annual Contributions and Payments

The amendments to the Bye-Laws concerning Annual Contributions as proposed in *The Linnean*, 7(2): 5 were duly passed on 24 May 1991. The Annual Contribution rates from 28 May 1992 will be:

	Fellows	Associates	Student Associates
No Journal	£28.00	£14.00	£2.50
One Journal	£40.00	£20.00	
Two Journals	£65.00	£45.00	
Three Journals	£90.00	£70.00	

Those wishing to change their journal requirements should inform the Executive Secretary as soon as possible but definitely before 1 April 1992, to allow time for the necessary arrangements to be made with our Publishers. We will assume that those who do not inform us by that date wish to continue as before.

The Contribution of those paying by Direct Debit Mandate will be automatically collected by us on 28 May 1992. If you change your journal requirement and inform us by 1 April, the sum will be correct.

Those who pay by Banker's Order will have to change this with their Bank as the Society cannot alter Banker's Orders. PLEASE DO SO AS SOON AS POSSIBLE.

Those who pay by cash or cheque should send the appropriate amount to the Office by 28 May 1992.

If you are unsure whether you pay by Direct Debit Mandate or Banker's Order we will be happy to let you know.

Notes

1. Fellow and Associates subject to UK tax laws are reminded that they may claim tax relief on their Annual Contributions and it is understood that certain other nationals may make similar arrangements. This relief of course mitigates the increased charge for a second journal.

2. The publishers will continue to despatch journals as currently instructed. A failure to notify the office of a reduced requirement in good time, i.e. at least a month before the due date, will regretfully incur the marginal extra cost.

3. Fellow who have access to U.K. banks are strongly encouraged to pay by Direct Debit Mandate, and this is the method preferred by the Society. Anyone contemplating changing to this method should apply now.

4. Fellows living overseas are reminded that as the Society has a U.S. dollar account, payment may be made in U.S. dollars.

5. To save postage, invoices are not sent automatically. If they have not already done so, Fellows wishing to receive an invoice annually should write to ask for this.

The Society's Grants

Awards from the Society's Special Funds in 1991 were made as follows:

Appleyard Fund

£190 to Mrs Jeanette Fryer, F.L.S. to enable her to visit Strasbourg in connection with a revision of the genus *Cotoneaster*.

£1000 to Dr Olive Hilliard, F.L.S. for a published revision of the tribe *Manuleae* of the Scrophulariaceae.

£515 to Dr Phyllis Knight-Jones, F.L.S. to work on sabellid tube worms.

£1000 to Dr Gerald Wickens, F.L.S. for publications connected with the Sahel Oral History Project.

Bonhote Fund

£850 to Mrs Susan Armstrong for work on the mechanics of meiosis.

Omer-Cooper Fund

£1310 to the Balfour-Browne Club to enable six delegates to attend a meeting in Esbjerg, Denmark on European water beetles.

£500 to Dr Garth Foster, F.L.S. to attend the 6th Congress of Spanish Limnology in Granada.

£2307 to Dr Stephen Tilling, F.L.S. for work in connection with the publication of a key to the woodlice of the British Isles.

NERC Grants for Taxonomic Publication

£3000 to Prof. R.A.D. Cameron, F.L.S. for illustrator's fees for a second edition of British Land Snails (in the *Synopses of British Fauna*).

£1500 to Dr D.M. Holdich for the employment of an artist in connection with the second edition of Tanaids (*op. cit.*).

£500 to Dr Ian Lucas towards the production of an introductory guide to the identification of marine phytoflagellates.

No award was made under the terms of the Irene Manton Prize in 1991.

Members are reminded that the closing date for applications for the Society's grants is 31 March, save for the Irene Manton and Jill Smythies Prizes, for which the closing date is 30 September.

The Last Slide Show

The Society's rooms are used for a variety of meetings, over the years successive Executive Secretaries have built up an impressive (more than 50)

Colonies per km ²	0.1 (Optimum density)	1.0 (Equilibrium density)	10.0 (World maximum density)
0.1	Highly sparse	Optimal	Extremely dense
1.0	Optimal	High density	Extremely dense
10.0	Extremely sparse	Extremely dense	Extremely dense

collection of 'last slides', which have been left in the Society's projectors after meetings. You may, of course, recognize one of your own. If so, please claim it.

Six of these slides are reproduced here. Contributions are invited which suggest how these six slides might form part of an oral presentation of 5–10 minutes duration. Modest prizes will be offered for those published.

From the Archives

Captain James Laskey and James Edward Smith

FRED R WOODWARD

On 20 December 1797 the following letter was written by Captain James Laskey to James Edward Smith:

Crediton 20 December 1797

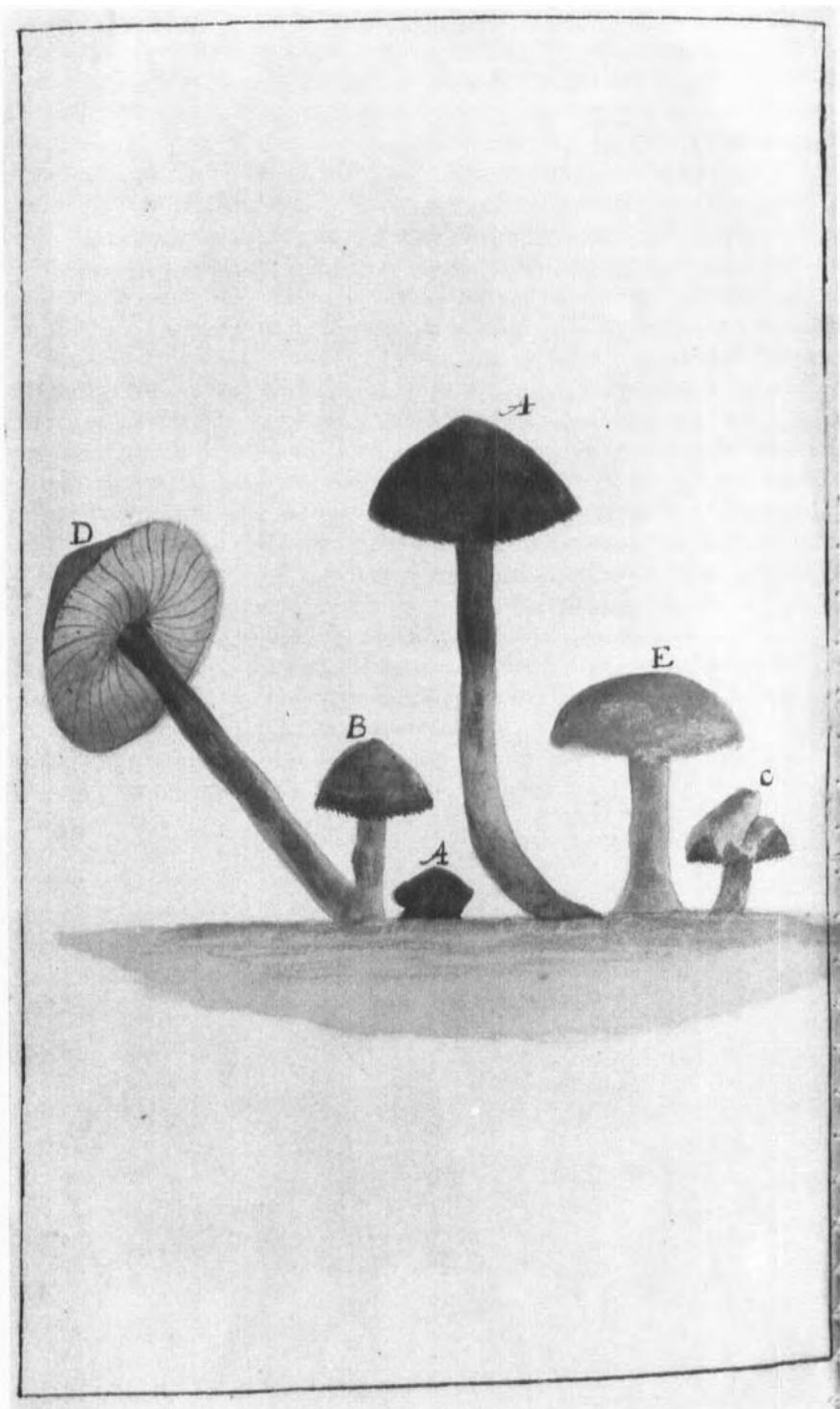
Respected Sir,

Tho a stranger to you I have taken the liberty (not doubting your liberality to forgive the trespass on your time should the subject prove of no consequence by being common) of enclosing for your inspection a drawing of a fungus found by me on the 9th day of October last within the Parish of Crediton and County of Devon. Its beautiful appearance attracted my attention at a distance growing in a meadow on a hillock covered with a coarse springy grass with a mossy bottom, the figures are after nature, but the colouring inadequate to the beauty and lustre of the originals. There were about 100 growing within a small space very few of which (not above 5 or 6 partook of the size of the figure marked A & D. The latter is purposely placed in that position for showing the gills &c. The remainder vary in size and shape as figures B, C & D. On drying they shrunk considerably and became of a beautiful bright orange colour as at E. The edges of the pileus are feathered in their native situation. They appeared covered with a moisture of a clammy texture which greatly added to their beauty. the under part of the pileus or gills consist of 32 laminae of a faintish orange colour and the same number of partial ones. Being a novice in botany I am at a loss to ascertain whether this is a species in the Cryptogamia family which has been ascertained or otherwise, If so I suspect it must be rare (at least in these parts) never recollecting to have seen a specimen resembling them ere this, altho I am particularly fond of prying into the recesses of nature where I should suppose they must have occurred and have been seen by me. On the 28th day of November following I again visited the spot and found only 3 specimens very small but of the same beautiful appearance and texture which is of a fleshy nature. If it is not trespassing too much Sir on your time and other avocations a line from you will be much esteemed with its name and synonyms.

I am sir
Yours & c
J Laskey

To Dr J. Smith

President of the Linnean Society, London.



Dr Smith replied to Laskey, a copy of his letter in Laskey's hand reads as follows:

The letter with which you have honoured me after various miscarriages has reached my hands and I am very much obliged to you for it, as I shall be for any communications relative to the *Flora Britannica* in which I have long been engaged.

Your Agaricus seems to me the rubens,—Withering ed. 3d vol A 229—please, to observe the synonymns Ag Coccineus Bull'd & rubens Bolt & hemerirous Fl. Dan.; which With'g has put to his next species (*angulatus*) belong to rubens as he has marked it in the corrected copy sent me. Now your drawing and history most precisely agree with my col'd copy of Fl. Dan. t.715 as well as with all With'g says of rubens—I have not Bolton's work.

I have found your Agaric I think plentifully last October on the hilly pastures of Cardiganshire, where I spent 5 weeks.—I have by me a drawing I made long ago at Edinb.g of a species I used to call *flammeus* very near this if not the same but I think the stalk is thicker, & whole plant paler. These are both distinguished from *A. aurantia* of Lightfoot by not turning black but pale in decay. *A. sanguineus*, Jacq. Misc. austr. vol 2 107 t, 15. f. 3 is very near yours & I think the same.

If you favour me with any more letters please to direct to Dr. Smith Norwich. From March 20th to April 17th I shall be in London, direct to me there if you please at the Linnean Societys Panton Square & from that time to May 20th under cover to T. Johnes Esq. MP. Hafod, Cardiganshire by Rhayder Bay.

I have the Honor to be
Yr Obliged & very obt. sert.
J. E. Smith

Picture Quiz

The August Quiz (7 (3): 9) figured St. George Jackson Mivart (1827–1900), barrister-at-law, comparative anatomist, primatologist and theist. He was born in Brook Street, London, in a small private hotel built by his father. The hotel, once the Mivart, is now known as Claridge's. Mivart's formal education included a brief sojourn at Harrow (which he hated), Clapham Grammar and then King's College School. The latter was apparently to prepare him for Oxford, but whilst at King's he fell under the influence of the Tractarian's William Ward (later the editor of the *Dublin Review*) and Dr Brewer (with whom he boarded), and in 1844 at the age of 16 became a member of the Roman Catholic Church. This conversion made attendance at Oxford, or graduation from any other U.K. University, with the notable exception of University College (the founding college of the University of London), impossible. Instead Mivart attended St. Mary's College, Oscott, a well known haven for converts from the Oxford Movement. Two years later (1846) he returned to London and took up the study of law at Lincoln's Inn.

Mivart's early interest in science (zoology in particular) was fostered and encouraged by both his father and his father's circle of friends which included Richard Owen, the ornithologists John Gould and William Yarrell, George Waterhouse, Secretary of the Zoological Society, John Gray, Keeper of Zoology, British Museum and Lord Farnham. This interest was further stimulated by



Who? (clue—he nearly ruined himself for Linnaeus). Solution by March to the Editor.

trips with his father to Steven's Auction Rooms, King Street, Covent Garden where they would bid for natural history specimens and by his father's copy of Buffon's *Histoire Naturelle* (a first edition presented to him by Queen Caroline of Brunswick).

Although called to the bar in 1851 Mivart apparently never practised law—instead he returned to his real interest, the study of systematic zoology using the concepts of analogy and homology taught him by Richard Owen.

Then, ten years later in 1862 at the age of 35, he began his professional career as lecturer in Comparative Anatomy at St. Mary's Hospital Medical School.

This new choice of career was apparently stimulated by his meeting in 1859 with Thomas Henry Huxley who became his friend and intellectual confidant. However, it was Owen's influence that gained him the lectureship. Oddly enough, neither Owen's nor Huxley's name appear on Mivart's certificate of recommendation for election to the Royal Society (1869); instead he was supported by, amongst others, Charles Darwin and Albert Gunther!

To many, Mivart was merely one of Huxley's protégés, but if you read their respective publications it is clear that Mivart knew more about primate morphology and probably vertebrates generally than Huxley did. Mivart's early papers are essentially Darwinian but later when he turned his back on natural selection and reverted to the God-guided concept of evolution propounded by Owen, Huxley became his enemy.

A year before he died Mivart finally cast off the yoke of papal infallibility (over the persecution of Dreyfus) and was accordingly excommunicated. On his death he was buried in the unhallowed ground of Kensal Green Cemetery without benefit of clergy. The epitaph on his coffin (which figured in the clue) fittingly read 'out of the shadows into truth'.

There were three additional winners of our March Quiz (7(2): 7), all antipodeans—Ralph Grandison, E. D. Hatch and David Fountain; with Ralph Grandison pointing out that it was Sparrman (a Swede, who joined at, and later departed the expedition at Cape Town) who was responsible for the plant in the illustration being brought to the notice of Linnaeus the younger through a letter (containing a botanical description and illustration), now in the Linnean Correspondence IV: 280.

There were two correct answers to that August portrait of Mivart: Dr B. Burnet and Prof. William Stearn.

Correspondence

9.9.91

2 Campden Terrace,
Linden Gardens,
Chiswick,
London W4 2EP

Dear Brian,

I'd like to add a few more words in praise of the late Dr Beverley Halstead, F.L.S., who died so tragically in a car crash while on the way to Plymouth from Bath on April 30 1991.

I may have been one of the very last people with whom he spoke. Just before he set off for Plymouth, he phoned me at the *Nature* office, exhorting me to attend a meeting of the Geologists' Association the following Friday, at which he was to have delivered his Presidential Address. As ever, he was full of enthusiasm, plots and schemes, and I was looking forward to the meeting and (no doubt) sharing a few beers. I forgot all about it though, until I learned of his death two days later.

Bev was one of those very few people, in any discipline, with the ability to inspire a whole generation to follow in their footsteps. His popular books turned me on to fossils at an early age, but I didn't actually meet him until I did a stint as a vacation student at the BM(NH) in 1983, when he discovered me hidden away in a remote corner of the Palaeontology Department, re-labelling fossil fishes for Peter Forey. Two lifelong ambitions were fulfilled in the space of one lunchtime—to meet Bev Halstead and drink several pints of draught Ruddles County.

He was awkward, capricious, and an editors' nightmare. He was also hospitable, energetic, kind and—having successfully faced cancer—brave. I am sure that many researchers of my age (39 or thereabouts) feel the loss of somebody to whom they could always turn as an ally, as well as one of biology's most engaging characters.

Yours sincerely
HENRY GEE

18.6.91

Glasgow Zoo,
Calderpark,
Glasgow G71 7RZ

Dear Sir,

International Conference on Molluscan Conservation

The University of Glasgow will be the venue for an International Conference on Molluscan Conservation on 10–12 September 1992. Sessions will include Taxonomy; Distribution; Legislation; Conservation. For further information contact: Fred Woodward, International Conference on Molluscan Conservation, Kelvingrove Museum & Art Gallery, Kelvingrove, Glasgow G3 8AG, Great Britain. Fax: (041) 357 4537 Telephone: (041) 357 3929.

Yours sincerely
DAVID G. HUGHES

The State of Soviet Science and Medicine

The recent turmoil in the Soviet Union has focused attention on the realities of political life under the Soviet system. Whilst President Gorbachev introduced a revolution in political thinking which gave Soviet citizens the confidence to fight for the reforms that he had initiated, it is debatable whether he has had much success in amending the stultifying bureaucracy which so nearly overturned him. No matter what changes are instituted by reforming politicians, civil servants are ultimately responsible for enacting or opposing these changes. Less than a month before the August putsch, a private American foundation sent a delegation on Infectious Diseases to Leningrad and Moscow. The foundation, People to People International, was originally established as part of the U.S. Information Agency by President Eisenhower as a means of preserving individual scientific and technical contacts throughout the Cold War.

The delegation consisted of 40 scientists and doctors drawn mainly from the U.S.A. but including representatives from the U.K. Canada, Australia, New Zealand, France, Holland, Germany, Finland and Switzerland. Within the group were microbiologists, infectious disease physicians, molecular biologists, epidemiologists and immunologists, with particular interests in the study of AIDS, hepatitis, zoonoses, and the epidemiology, classification and molecular pathogenesis of infectious diseases.

The delegation's brief was to examine the present state of Soviet science and medicine as it applies to the study of infectious diseases and to make contacts and exchange information with fellow scientists and physicians. The principal sites visited included the Leningrad Pasteur Institute, the Gamaleya Institute of Epidemiology and Microbiology, the Ivanovski Institute of Virology and the main infectious diseases hospitals in both cities.

Although the Ministry of Health has ultimate authority over all medical services and biomedical research, there is an important division between the medical services run directly by the Ministry and the higher status basic research administered by the Soviet Academy of Sciences through a network of Institutes. We were interested to see how far Gorbachev's *glasnost* had spread into the scientific and medical community and how open our discussions would be. In most cases the public debates were open, though there was a reluctance to admit to the scale of some public health problems or the inadequacies of equipment. Prestigious institutes host many World Health Organisation Reference Centres; for example, there are five at the Ivanovski Institute of Virology and 11 at the Gamaleya Institute of Epidemiology and Microbiology. At an international level there were treaties on scientific co-operation at governmental, ministerial and institutional level; for example, there were bilateral treaties on research on influenza, AIDS and hepatitis with the United States. All the scientists and physicians that we spoke to were anxious to encourage further international co-operation and contact, and were more willing to address major international health problems such as AIDS and hepatitis than previously.

Nevertheless, AIDS was still seen very much as a Western problem and there was occasionally reluctance to debate that which did not appear to be a significant Soviet problem. The official figures support this view. There are ostensibly only 627 people who are Human Immunodeficiency Virus (HIV) positive and of this number 258 were children who were infected iatrogenically from contaminated needles in three epidemics in the southern U.S.S.R. These extremely small numbers are not apparently due to lack of screening; over 50 million tests had been conducted according to one scientist. The number of clinically symptomatic cases of AIDS was therefore correspondingly small; for example, there were only 36 cases to date in the Leningrad region. Several scientists expressed the view that the low numbers were, in part, due to Soviet isolation from foreign contact, which explained their policy of compulsory HIV testing for foreigners resident for longer than one month and deportation for those found to be HIV positive. Intravenous drug abuse does not appear to be a significant risk factor however. The supply of disposable syringes to the medical system is limited and it was suggested that lack of availability to the drug user was one explanation*.

*There is a great public awareness to the dangers of AIDS in Russia. Thus the only advertisements on the Moscow Metro are to mind the doors and to keep AIDS at bay. Editor.

AIDS-related services are organized into six regional centres; for example, the Leningrad centre serves a population of over 10 million people. These centres have; (1) tested all blood donations since 1986; (2) tested over 400 000 drug addicts with not one confirmed positive result and (3) tested some 25 million pregnant women with 20 confirmed HIV positive on Western blotting. Immunoassay followed by Western blotting to provide confirmation of positivity is the standard system employed.

Hepatitis is a major problem particularly in the central and southern regions of the U.S.S.R. and hepatitis virus types A to E have all been identified. Officially there were 1 million cases of hepatitis, though one physician felt that the number was probably double this. Annually there were 5000 deaths from hepatitis B (HBV) infection which included approximately 3000 children, mostly of mothers who were chronic HBV carriers. In parts of the central region of the U.S.S.R. the prevalence of HBV was over 20%.

Research and diagnostic laboratories varied in the quality and quantity of equipment available. The equipment in the laboratories of the handful of scientists holding 'hard currency grants' rivalled any available in top Western laboratories, but in the majority, and in particular the diagnostic ones, the equipment was often old and sparse. Some analytical equipment was produced by Soviet firms or cobbled together through individual ingenuity but much was expensively imported. Previously researchers had been entirely funded by the Ministry of Health through the Academy of Sciences, but inflationary pressures have forced many to seek additional monies elsewhere. Scientists can now obtain payment for solving applied biological and technical problems for Soviet industry but the majority still comes from the government. New Committees for Science and Technology have been established which will fund specific named projects, and Soviet scientists now submit grant proposals to new Scientific Councils in specific areas such as AIDS and biotechnology along Western lines.

The Soviet medical system is highly specialized and quite different from our own system. For example, there may be separate hospitals dealing with diphtheria, tuberculosis, other bacteriological diseases and virological diseases. The high degree of specialization means that the initial diagnosis by the primary care physician must be fairly accurate if the patient is not to spend a great deal of time shuttling between hospitals. Some 15–20% of patients were transferred to other hospitals according to one senior physician. Under-equipped diagnostic laboratories would often be unable to provide much support to clinicians and could be geographically distant from both patients and doctors. There were clear limitations on the treatments that were available. Intravenous therapy was restricted by the shortage of syringes and some important antibiotics such as vancomycin were not readily available.

The dedication, ingenuity and achievements of Soviet scientists and physicians was quite remarkable. With increasing opportunities for contact and discussion the international scientific community will be enormously enriched.

FRANCIS DROBNIEWSKI

Molecular Parasitology

These days the word *biology* is frequently preceded by the word *molecular*. Some people are getting used to it. But *molecular parasitology*? This is the title of a book

published last year. Much of modern research on parasitic disease is at the molecular level—chemotherapy and identification are heavily dependent on molecular approaches, the latter more successfully than the former. Progress in chemotherapy is hindered by a perception that those most in need of treatment will not be able to afford it. Undoubtedly the highest hopes are pinned on immunization against parasitic disease, and an antimalarial vaccine is currently on trial in Latin America.

There are many obstacles in the way of developing such vaccines, not all of them scientific. Some countries will insist that such vaccines are tested in the West to Western standards of safety. Whilst this may sound all very well, there are problems in finding suitable subjects for tests on diseases which do not exist much, if at all, in Western countries. Regrettably, too, morbidity and mortality have very different significances in countries where half the population does not achieve adulthood. But once these arcane problems have been resolved, there remain serious scientific doubts as to how effective vaccines will be.

Bloodborne parasites have developed some slick ways of side-stepping the complexities of the human immune system, which, incidentally, differs substantially from the immune systems of other animals, thus adding to the problems of proper testing. Some parasites, such as *Plasmodium*, put up an immunological smokescreen of simple peptides which exhaust the immune system, causing the disease symptoms, as well as weakening the host towards other infections, such as AIDS and Epstein-Barr virus, the cause of Burkitt's lymphoma. African trypanosomes change their coat proteins as they reproduce, so that although many may be destroyed by the immune system, there are always some to carry on the cycle of growth. Yet others live in immunologically (under) privileged areas—the gastrointestinal tract, bile ducts, reproductive tracts, or even, in the case of a few parasites, within cells of the immune system itself. In such places there is at best partial immunological surveillance. It seems doubtful whether vaccines are going to be effective against such consummate opportunists.

Molecular biological techniques tell us that many bloodborne parasites have been around for a very long time, probably as simple parasites of insects, as the *Crithidia* remain today. Gradually they developed a more complex lifestyle involving another host, which has, presumably, changed as time has moved on. So, it seems, the virulent *Plasmodium falciparum* is a recent arrival in man, probably from the avian world. Most parasites have learned to allow the host to survive, since it is their interests to do so. The immunological battle has been waged a long time, too, indeed there is evidence that some parts of the immune system, notably the IgE pathway, have evolved specifically to combat certain parasites. In Western man, such superfluous surveillance is now a nuisance, responding to various spurious challenges with unpleasant, and sometimes life-threatening, allergic reactions.

Given the duration of this particular arms race, will molecular biology be any more successful? The basis of the vaccines to be used is that there are proteins present on the surface of some parasites which could be used as immunological targets. A person sensitized to such a protein would reject the parasite. Why hasn't this happened naturally already? The answer to that question seems to be a little vague, but we are told that some of these proteins are cryptic, that is, tucked away where the immune system cannot recognize them. Or, of course, it may have its hands full dealing with more obvious proteins. It does seem to me

that there is more than an element of luck in this approach, although we are told that considerable success has been achieved with mice. Two things should be pointed out. Firstly, vaccination is only going to be effective against a very few parasitic diseases; malaria and schistosomiasis are favourites. Secondly, once the genes for the parasitic protein targets became known (in 1985), it has taken only three years to develop the vaccines. Here genetic engineering techniques are essential to generate sufficient vaccine, since the parasites themselves cannot be maintained and multiplied *in vitro*. Killed plasmodia do, in fact, provide a reasonably effective vaccine against malaria, more effective, that is, than their engineered counterparts. It seems that the development and stability of immunocompetence against the parasite are much more variable in the case of the synthetic vaccine. Notwithstanding the problems, there is sufficient confidence in this approach to go to clinical trials. We must hope that it is justified.

J. C. MARSDEN

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Stinging Nettles

The family Urticaceae comprises some 50 genera, 12 of which include species with stinging hairs.

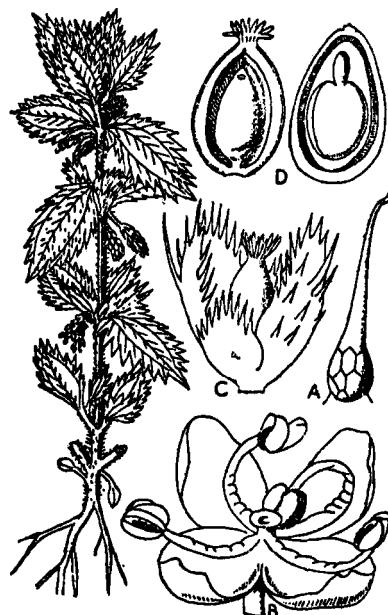
There are three species of stinging nettle in Britain: the common, perennial, stinging nettle *Urtica dioica* L., with separate male and female plants, the more local annual, monoecious small nettle *Urtica urens* L. (whose sting is the more severe) and the annual Roman nettle *Urtica pilulifera* L., said by the antiquary Camden to have been introduced by Roman Legionnaires as a flagellatory antidote to the weather around Hadrian's Wall¹ and which today is abundant in Norfolk and Suffolk.

The common stinging nettle, *U. dioica* (*Species Plantarum*, 2: 984; 1753) is a vigorous, long-lived, cosmopolitan weed which often occurs in dense stands from the Isles of Scilly to the Shetlands and from the coast up to 750 m in the Pennines. It grows on clay, peat and sandy soils, on heath and fen and in open and dense woodland but it is most frequently found growing in nitrogen-rich soil around human habitations. It is usually dioecious with stinging hairs on all stems and leaves (*urere* = to burn or sting) and its dark green colour testifies to the fact that it is one of the world's most chlorophyll-rich plants. The flowers appear in pendulous clusters at the tip of the shoots; rarely the upper part of the inflorescence bears female flowers and the lower part male or hermaphrodite flowers and *vice versa*. Pollination occurs in the early morning when the anthers turn inside out. This highly variable species which reaches its full height in late July (30–150 cm) occasionally produces giant individuals of over 3 m, but even

¹This is substantiated by *Apuleius's Herbal* (an Anglo-Saxon MS from c. 1000) which maintains that nettles rubbed over the body causes the cold to depart away—the Romans apparently having been told that the cold in England was unendurable, knew of the remedy and brought their own nettles with them!

this cannot compare with the Nilgeri nettle of India (*Urtica heterophylla* Roxb.), a variety of which regularly reaches 11 m!

In medieval times the stinging nettle was perceived as a valuable medicinal plant. The roots and leaves were used to treat kidney stones and lymphatic imbalance ("it expelleth gravell and causeth us to make water", *Gerarde's Herbal*, 1597), while its effectiveness against all kinds of bleeding, particularly menstruation was early recognized ("for woundes..... to cause the floures to flowe in women..." *Grete's Herbal*, 1526). Moreover, the leaves were often boiled



The small stinging nettle, *Urtica urens* L. from Hutchinson, 1945, *Common Wild Flowers*, Penguin.

in white wine and the resultant liquid used to treat jaundice (Physicians of Myddvai), whereas the seeds were used externally to slow down hair loss (*Brunfels's Herbal*, 1534) or as a rinse to remove dandruff. It is also said to be very effective in restoring colour to greying hair but caution is advised since "the seed of the nettle stirreth up lust" (*Gerarde's Herbal*). This latter attribute may be the reason why the seeds are also reputed to dispel melancholia; more certain, however, is that when powdered and used as snuff they will arrest nosebleeds (*Grete's Herbal*; *Fuch's Herbal*, 1842).

Country people always used to make nettle soup, or boil it as a vegetable like spinach (I was served it as a child but hated it—it had a rather gritty taste which I now realize was due to the cystoliths² or deposits of calcium carbonate inside the enlarged epidermal cells, visible as dots, particularly in pressed dried leaves) because they valued its high calcium, iron and vitamin C content, while they added the new shoots to their stock pot to cleanse the blood and strengthen the

²A synapomorphy of tricolpate dicotyledons.

circulatory vessels (cf. Physicians of Myddvai) and as a remedy to ease rheumatism (by its action in increasing uric acid excretion it is also widely believed to be a cure for arthritis, gout and sciatica). This property for cleaning and purifying the blood is thought to relieve high blood pressure and to be particularly beneficial in the treatment of childhood eczema, whereas an alternative remedy for its use in the treatment of rheumatism is as a counter-irritant, with the whole plant being used as a whip—the pain of the stings presumably makes the sufferer forget the pain of the rheumatism! Perhaps as a



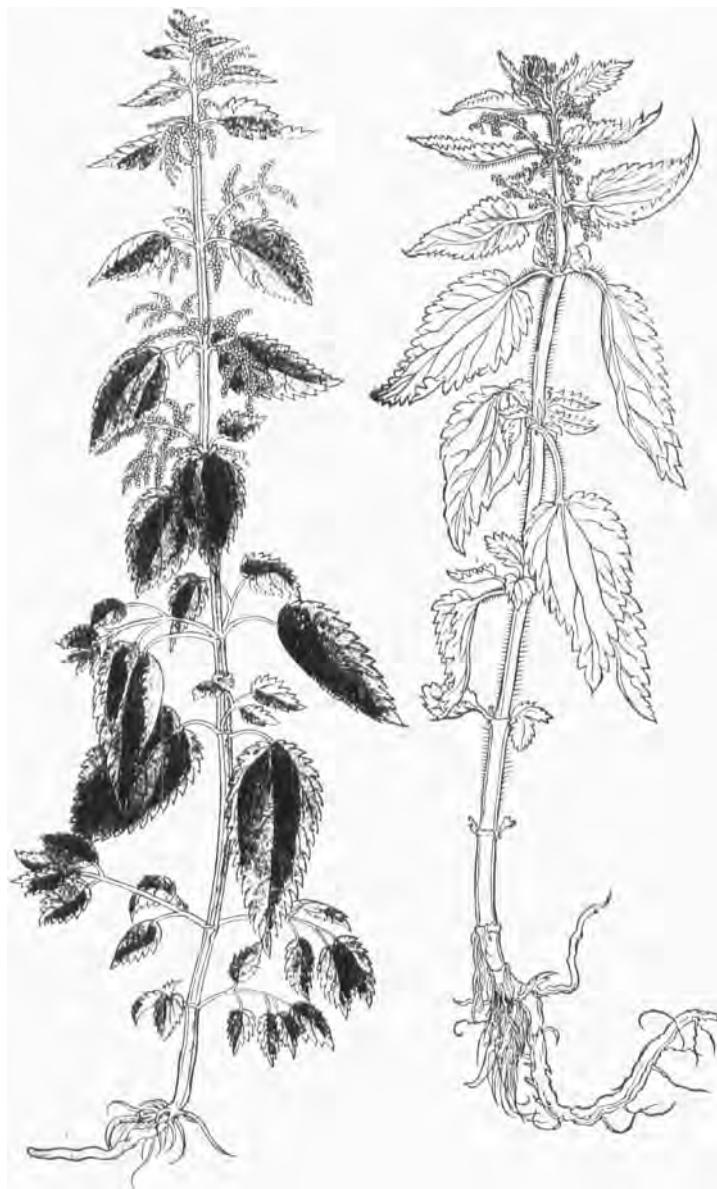
For the floures. **E**
Co cause the floures to flowe in women
Take the iice of nettles and wyne / & put
it in the matryce. **C**o encreas the appe-
tite of lecher y drynke nettle sede often w
wyne. **D**r confycte the sayde sede in electu
ary with honny and paper / and vse it. **A**lso y
water that it is sodē in with honny is good
for them that haue theri mylte intamed / &
apotheine in y longues / often vse of sweet
wyne and honny clenseth the longues.

Stinging nettle from *Grete's Herbal*.

sop they were then given a glass of nettle beer, an old country drink something like ginger beer.

The herbals in which most of this information is contained were published over a period of about 200 years (1470–1670). Although the first woodcuts were derived from a direct study of the plants concerned they were later copied and recopied from book to book until the illustrations became but crude and stylized versions of the real thing (viz. *Grete's Herbal*). However, the publication by Schott & Strassberg of *Brunfel's Herbal* in 1534, in which the plants were all drawn from nature, heralded the beginning of the Golden Age for both herbals and *materia medica* generally.

As well as being traditionally used as a therapeutic agent in herbal medication, the nettle has a long history in both cloth and paper making. Prior to the introduction of hemp and flax in the 17th century, nettles were used to make



Stinging nettle, left from *Fuch's Herbal*, right from *Brunfels's Herbal*.

both ropes and cloth. The strong nettle fibres could easily be spun into ropes but these were less flexible than hemp and would not for example take a reef knot though they were used for fishermen's nets. During the first World War, when

the Germans ran short of cotton they reverted to the old practice of using nettle fibres to make their military clothing. They are reported to have gathered something over 2½ million kilograms of the stinging nettle from the wild—though it took 40 kilograms of these to make a single shirt. Today in parts of Nepal the locals produce a high-class fabric as well as string and rope from the white, silky fibres of the Nilgeri nettle. Through careful cultivation they are able to produce two crops a year and a yield close to 700lb per acre annually. In paper manufacture almost any fibrous plant can be used. All that is necessary is to separate the relevant fibres, bleach and pulp them. Nettle paper was last widely produced in Russia in the early 1880s but today handmade plant papers are still manufactured in Kent. The stinging nettle paper has a unique texture; it is off-white in colour and pleasant to write on with pen and ink.

Nettle leaves, because of their high protein content, can also be of benefit to many animals. Thus, in Sweden *U. dioica* is cultivated for cattle feed while the fresh leaves are chopped up and mixed in with poultry food to improve its nutritional quality. Here in the U.K., however, the plants are dried and powdered before being added to livestock feed since fresh nettle is generally considered to be unpalatable. This belief is probably related to the nettle's pain-producing properties against humans. It has long been assumed that the stinging hairs serve a protective function against mammalian grazing and older anecdotal literature maintains that the nettle is refused by quadrupeds in general—the ass excepted. But some breeds of domestic cattle avoid nettles whereas other breeds readily eat them; nettles also constitute a significant portion of the diet of the European bison and remains of stinging hairs have been found in samples of rabbit dung. Nevertheless, the highly specialized stinging hairs or trichomes must have evolved as a deterrent to herbivores, particularly mammals. This last supposition has recently been tested by Pullin & Gilbert (1989). The stinging hair density of *U. dioica* is genetically based, heritable and exhibits a high degree of variability (Pollard & Briggs, 1982). Pullin & Gilbert found that plants from grazed fields had significantly higher trichome densities than those from ungrazed fields and that regrowth plants had higher trichome densities than the initial growth while the shoots from the centre of the patches had lower trichome counts than edge shoots more exposed to grazing. Although these stinging hairs may be an effective deterrent against many grazing mammals they are of little defence against the hordes of invertebrates which obtain food and shelter amongst the dense stands of nettles. A dozen or more mollusc species and some three dozen different insects eat nettles freely and their faeces are often packed with stinging hairs. This apparent disregard for the stinging hairs contents may in part be due to the absence of a sophisticated immune system in protostomes. Davis (1983) has shown that a bed of nettles is often teeming with animal life, 90% of which will be insects with the remainder made up of spiders, harvestmen, woodlice, slugs and snails. He further lists some 31 species of insect which are more or less confined to stinging nettles—these include the larvae of ten species of Lepidoptera, especially the small tortoiseshell (*Aglais urticae* (L.)), the peacock (*Inachis io* (L.)) and the red admiral (*Vanessa atalanta* (L.)),³ six species of Diptera comprising three leafminers, two stem borers and a gall midge and several species of Coleoptera—mostly weevils but including

³These three nymphalid species of Linnaeus should all be properly placed in the genus *Nymphalis*.

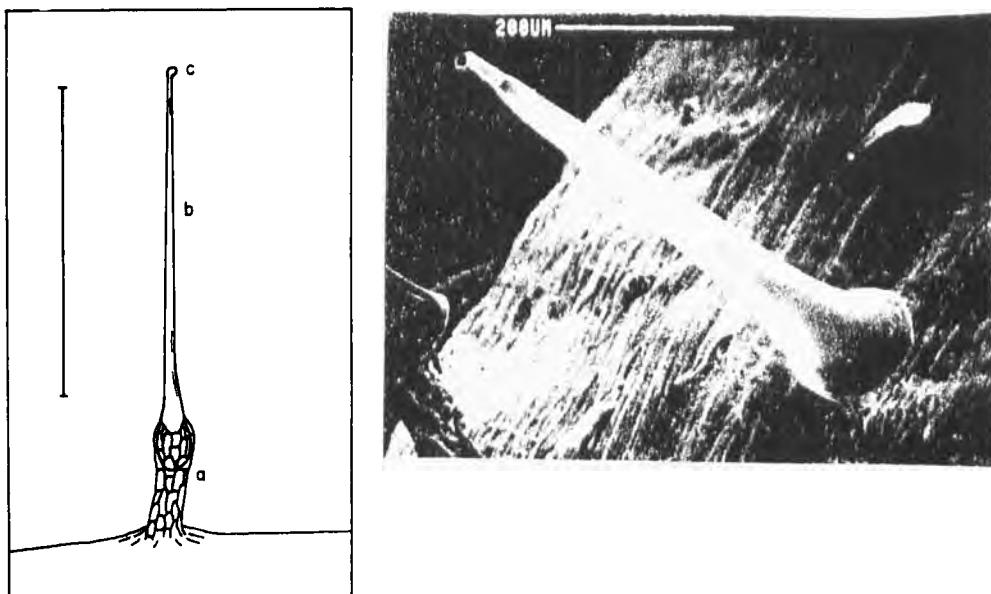
the flower beetle *Brachypterus urticae* Fabricius. He further records the presence of 75 other species of insect associated with stinging nettles. These include scorpion flies, thrips, aphids and hoverflies. While seemingly unable to combat the ravages of molluscs and arthropods, nettles have a second defence mechanism in addition to their stinging hairs. Broekaert and his colleagues (*Science*, 1991; 245:110) have recently found that concentrated in the roots and rhizomes of nettles is a lectin (a protein that recognizes and binds to specific polysaccharides such as



Red admirals and pyralid moths on stinging nettles.

chitin), which they suggest protects the nettle from invasive fungi. So, ironically, whereas the stings have no effect on the chitinous exoskeleton of arthropods, in their roots the nettles have a chitin-bonding lectin which interferes with the growth of fungal walls.

The structure and mode of action of the nettle sting has been the subject of innumerable publications but even today little is known of the cellular and molecular mechanism of nettle urticaria. The stinging hair consists of an elongate, tapering stinging cell with a slightly swollen tip in the form of a little bulb mounted on a multicellular pedestal; the entire structure is approximately 1.5 mm in length (Thurston, 1974). The walls of the tapering stinging cell are silicified and therefore brittle and when brushing contact is made with the hair the bulb breaks off in a predetermined line, leaving exposed a fine needle-like point formed by the upper tapering part of the stinging cell. This point



Stinging hair of *Urtica dioica* L. Left, from Pollard & Briggs, 1984. a, Multicellular pedestal; b, stinging cell, c, swollen oblique tip of stinging cell. Scale line = 1 mm. Right, scanning electron micrograph from Sell, *Plant Contact-Dermatitis*.

penetrates the skin and the subsequent compression exerted on the pedicel squeezes the base of the stinging cell which actively injects toxin into the flesh. Interestingly, if you handle the stinging nettle roughly the stinging hairs snap off lower down and apparently do not penetrate the skin—hence the adage “to grasp the nettle”.

The sting of the nettle causes a stinging sensation or intense burning pain followed in most people by itching and slight welts. This stinging sensation which accompanies contact urticaria usually lasts for at least 12 hours and its effect can range from mild skin irritation to severe dermatitis. At least three pharmacologically active substances are present in the stinging hair fluid: histamine, which is presumed to be responsible for the itching sensation (Emmelin & Feldberg 1947) and whose mean content is 6.1 ng per nettle hair (Oliver *et al.*, 1990); acetylcholine which in combination with histamine is responsible for the burning feeling and present in a concentration of about 1 in 100 or stronger; and 5-hydroxytryptamine. Additionally Willis (1969) has

demonstrated the presence of water soluble, non-protein compound of moderately high molecular weight which occurs at far higher levels than these other three substances while Regula & Devide (1980) have demonstrated the presence of the vasoactive substance serotonin in the stinging cells of some species of *Urtica* (not *dioica*). The cutaneous cellular response to the stinging hair fluid is a significant increase in the number of mast cells at 12 hours (Oliver *et al.*, 1990), some of which show degranulation. This degranulation, which is also apparent 5 mins after nettle contact, strongly suggests that the mast cells have been sensitized and that in part the reaction to the sting (e.g. the welts) is an adaptive immune response. Mast cell degranulation releases histamine (additional to that injected by the stinging hairs) which in turn leads to immediate inflammatory effects. Moreover Oliver *et al.* (1990) also recorded the presence after 12 hours of 'dermal dendritic cells' in close association with the mast cells. Since dendritic cells are usually implicated in the presentation of antigens to T cells the possibility exists that there may also be delayed hypersensitivity, perhaps manifested on subsequent contact with the stinging hairs. Certainly many individuals become sensitized or allergic to nettle stings so much so that the slight welts of childhood become the large blisters and the generalized 'anaphylaxis' of adulthood. In this context it is interesting to note that in 1940, when the Linnean plant specimens were being photographed, Miss Gladys Brown was stung on the arm by one of the specimens of stinging nettle dried and mounted nearly 200 years earlier*. The arm showed a definite blister apparently similar to one produced by a fresh specimen. From this we conclude Gladys Brown had been sensitized by previous stings and that the active ingredient had stood the test of time preserved within its silica tube.

Finally for those of you who frequent our overgrown byways remember that crushed dockleaves lubricated with spittle and rubbed on the sting are said to instantly cool and soothe the inflammation, especially if the following charm is repeated:

Nettle out, dock in,
Dock remove nettle sting,
In dock, out nettle,
Don't let the blood settle.

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*There are 27 specimens under *Urtica* (genus 1111) in the herbarium; we do not know which one was responsible!

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B.G.G.

Statement by Professor J. G. Hawkes to the House of Lords Select Committee on Science and Technology Sub-Committee II-Systematic Biology Research

4 June 1991

My Lords,

I am speaking partly as the newly elected President of the Linnean Society and partly as a career systematist, who retired nearly nine years ago but still continues research in this scientific discipline.

As my predecessor mentioned in his report submitted to Dr Rhodri Walters on 28 March this year, the main aim of the Linnean Society is to encourage the study of biological diversity in all its aspects. Thus, research in systematic biology is central to our interests, though we are also very much concerned with the science of ecology, and especially the conservation of biological diversity throughout the whole planet.

I strongly believe that biological systematics is not only a scientific discipline in its own right but that it forms a framework into which other biological disciplines can be accommodated.

At one level, systematic biology (or taxonomy as it is often called) comprises the description and classification of biological organisms, also providing keys to their identification, and often figures and diagrams to help with this process. This is generally spoken of as *alpha-taxonomy*; it began with the Greeks at least two millenia ago. Proper naming and scientific description began with the 16th to 17th century herbalists, such as John Gerard, from this country. However, the foundations of 19th and 20th century systematic biology began with Linnaeus some 240 years ago [1753]. After Darwin's theory of evolution in the 19th century, systematists began to classify groups in a way that supposedly indicated their evolutionary relationships. This was largely inspired guesswork concerning the major groups of organisms, but had a stronger basis of factual reasoning in the classification of smaller groupings.

Later, however, in the 20s and 30s of this century the sub-discipline of experimental taxonomy grew up. This used experimental techniques such as genetics, cytology, crossability, biochemistry, serology and other methods to elucidate systematic relationships. These methods were fine for groups of living organisms, especially plants, but obviously could not be applied to dead materials or so we thought at the time.

These experimental methods were clearly just as 'hard' a science as biochemistry, chemistry and physics. Yet they relate very closely to the essential systematic work of collecting, naming and describing biological organisms, and

to the studies of plant and animal communities in their natural environments (ecology), as well as a study of their present and past distribution (biogeography).

Modern molecular methods, which can sometimes be used with fossil material as well as living organisms, have recently added a completely new dimension to our studies of systematics and evolutionary relationships. Particularly with plants, chloroplast DNA studies are opening up new vistas in our understanding of evolutionary relationships.

All these methods are particularly valuable from an economic viewpoint. Thus a study of the wild relatives of crop plants (wheat, barley, rye, maize, potatoes, etc.) helps plant breeders to clarify their results obtained from pest and pathogen resistance testing, to set them into a framework and to make informed choices of material for further studies. It also forms a basis for the scientific conservation of crop plants and their wild relatives as a source of breeding material for the years to come. I have been a potato breeder and taxonomist (I still am) and could give many examples of the importance of a taxonomic framework to help order results and provide directions for the future. It also greatly helps the directors of 'genes banks' where living seed and/or tissue culture collections are stored, and for which the results of systematic evaluation results must be entered into computerized data bases.

Without the science of systematics or taxonomy our molecular biologists would find it difficult to interpret their results—I know this from personal experience, since I frequently receive requests from those working on potatoes asking me to help them interpret their results for them, and to suggest new meaningful future work.

Thus, to sum up, I would like to make the following points:

1. Basic or alpha-biosystematics as carried out in museums, institutes, botanical gardens and universities, are an essential part of science, since they provide a foundation and a framework by which all other biological disciplines can be evaluated and understood.

2. Systematic biology in the widest sense provides us with a knowledge of new drugs, new economic products and the genetic diversity of plant species essential to horticulture, agriculture and food production, today and in the future.

3. Systematic biology also helps us to understand the evolutionary and biological relationships between organisms and to collate and interpret results from other biological disciplines. Without a continuing supply of experts in the field of systematic biology many or indeed most results from molecular biology would be very difficult to interpret.

4. In particular, systematic biology is an essential basis in attempts to conserve the fast disappearing natural ecosystems of forests, savannas, deserts and oceans. In short, we must know what to preserve in order to understand how to preserve.

5. We well know that expert scientists in the field of systematic biology are a diminishing resource. This is due to a variety of causes, of which your Lordships are well aware. However, at the risk of repeating the same arguments, I hope you will allow me to set out my own views on this subject. It seems to me that the main reasons for the decrease in the training and employment of Systematic Biologists are as follows:

(a) Swingeing funding cuts in Museums and Biological Institutes.

- (b) Similar cuts in University budgets.
- (c) The replacement of systematic biologists by others in what are deemed to be more 'fashionable' scientific disciplines, such as biochemistry and molecular biology.
- (d) The replacement of 'scientific curatorship' of collections, by 'maintenance curatorship'-to the detriment of scientific research.
- (e) The lack of job prospects in Systematic Biology for young scientists when choosing their careers, due largely to the funding cuts just mentioned.
- (f) The difficulty which young Systematic Biologists encounter in obtaining research grants, possibly due to the fact that grant-awarding committees are mainly composed of members of other scientific disciplines, and in a period of financial stringency funding requests for biosystematics tend to be passed by.
- (g) The quite unjustifiable concept in some quarters that Systematic Biology is dull, old fashioned and unscientific.

Thus, in my opinion, my Lords, and the opinion of the Fellows of the Linnean Society of London, Systematic Biology is an intellectually active scientific discipline, fundamental to other biological disciplines which could be playing a more important role in evolutionary studies and the conservation of biological diversity if it were funded better and given the support and consideration that it deserves.

The Conservation of Biological Diversity

During the last session of the Linnean Society's activities the problems of conservation of biological diversity (or 'Biodiversity', as it is increasingly being called) have come greatly to the fore. Thus, last November (1990) we held a joint conference on Strategies for the Rehabilitation of Salmon Rivers, attended by HRH The Prince of Wales, and for which a conference volume has already been published. This was only one of the symposia in which environmental issues were discussed, as Fellows will recall.

To end the session, the Society organized, together with WRI, IUCN and UNEP, an important European Consultation on the Biodiversity Conservation Strategy Programme. This took place on 22–24 July 1991, and a report by Professor Vernon Heywood on this meeting is given below. This was really a discussion meeting, with very few contributed papers and with a great deal of stimulating debate, often of a critical nature, but with the desire expressed by all participants of expressing ideas that would lead to immediate positive action.

Particularly gratifying was the presence of delegates from East and Central European countries, many of whom I had known personally from my own visits to their countries. It was a great pleasure to have them here with us in London, and their comments and discussions were greatly appreciated.

Clearly the Action Plan provided by WRI, IUCN and UNEP as a basis for discussion needed certain 'tightening up', and I understand from Professor Heywood that much has been re-written, based on this conference and no doubt on other sources also. However, all criticisms were far outweighed by the general value of the plan, as a genuine attempt to tackle the problems of biodiversity in all its aspects on a world scale.

Finally, I would like to add my own thanks to John Marsden, Marquita Baird and other members of the permanent staff of the Society for their tremendous efforts which resulted in an excellent and memorable meeting.

JACK HAWKES

Biodiversity Conservation Strategy Programme European Consultation

1991

In July this year the Linnean Society played a major role in organizing a European Consultation which formed part of a worldwide series of meetings organized by the World Resources Institute (WRI), the International Union for Nature Conservation (IUCN) and the United Nations Environmental Programme (UNEP). The aims of the meeting were to review the Biodiversity Strategy and Action Plan that had been prepared by WRI, IUCN and UNEP after extensive consultations with partner organizations, specialist institutions and individual scientists, and to ensure that it adequately covered the concerns of Europe. The Strategy and Action Plan is designed to mobilize worldwide action to sustain the living resources of our planet.

The Consultation, which was attended by over 100 delegates representing environmental and biological organizations, both official and non-governmental, was held at the Scientific Societies' Lecture Theatre in Savile Row. A special effort was made to ensure the presence of representatives of all East and Central European countries; altogether 13 were able to attend, from Bulgaria, Czechoslovakia, Hungary, Yugoslavia, Poland, Romania and the U.S.S.R., thanks to the generous support of the British and Danish governments. Delegates from Belgium, Denmark, the Netherlands, Switzerland, Portugal, Monaco and the U.K. also took part.

Delegates were welcomed by the President, Professor Jack Hawkes, and the opening address was given by Dr Martin W. Holdgate, Director General of IUCN. After presentations on the roles and interests of the participating organizations, discussions were opened on the Strategy and Action Plan itself after which the meeting was divided into a series of working groups which met over the three days of the Consultation to consider in depth particular aspects of the document such as training needs, economic aspects, genetic resources policy, assessment of biodiversity and the challenges of conserving and restoring biodiversity in Eastern Europe.

Also discussed were conservation in botanic gardens, the implications of the Common Agricultural Policy, economic sustainability, the orientation of EC Research into biodiversity, problems of implementing CITES, a European-wide system of vegetation classification, and, particularly, the need for further research in these subjects.

The discussions were often lively and attention was drawn repeatedly to the need for sound taxonomy as a basis for understanding biodiversity. The need for

a much greater emphasis on the biodiversity of microorganisms and invertebrates and of marine organisms was also stressed. A review document of the main European instruments on conservation such as the Berne Convention and the proposed EEC Habitats Directive was prepared by Hugh Synge acting as a consultant for IUCN, and copies were made available for all delegates.

Altogether it was a highly successful and stimulating meeting and Dr Kenton Miller, on behalf of WRI, IUCN and UNEP, expressed his gratitude to all the participants for their contribution to this important project. All the comments made were noted and will be taken into consideration in the preparation of the final version of the Strategy and Action Plan which will be launched later this year.

As a member of the International Steering Group of the Biodiversity Programme and the organizing committee I should like to thank the Natural History Museum for generously hosting a reception for the delegates and wish to express gratitude to the President and Officers of the Linnean Society for agreeing to act as hosts for this meeting, for providing a reception for the delegates and especially to the Executive Secretary Dr John Marsden, Marquita Baird, and other Linnean Society staff for their splendid work in making the logistical arrangements for the Consultation and, in particular, looking after the East and Central European delegates.

VERNON H. HEYWOOD

Systematics and Conservation Evaluation

The Strategy programme outlined in the previous report is designed to sustain the living resources of our planet. One part of this strategy is the evaluation of areas of the world in terms of their complement of species and their contribution to worldwide species diversity of any given group. Systematics and biogeography play key roles. Systematics discovers the species, describes them and determines their phylogenetic significance and biogeography determines areas of endemism. For any evaluation of areas that we may wish to conserve then this systematic evaluation is crucial and provides justification for our choice.

Next June the Linnean Society, together with the Systematics Association and The Natural History Museum will co-sponsor a meeting designed to address the problems posed by systematics and choosing between areas. The meeting will be held at The Natural History Museum (17–19 June 1992), where the talks will be presented by 30 invited speakers covering an international spectrum. The three main themes for discussion will be scientific evaluation of areas using various groups of plants and animals, the monitoring of biodiversity through data bases etc. and assessments from those who advise governments about conservation strategy. A number of poster contributions will be accepted. For further details please contact the Executive Secretary at the Linnean Society, or Chris Humphries (Botanical Secretary) and Peter Forey at The Natural History Museum (071-938-9260/8843).

Record of the Proceedings of The Linnean Society of London for the 203rd Session (1990–91)

The Anniversary Meeting

This was held at Burlington House, on 24 May 1991. The President took the Chair and welcomed some 50 members and their guests to the meeting. Apologies were received from Professor Gareth-Jones and other Fellows.

The following signed the Obligation in the Roll and Charter Book and were admitted Fellows: Pierre Rasmont, Thomas Bruno Ryves, Louis A. Somma, Peter van Dijk, James W. White and Robert Martin Woollacott.

The Minutes of the Meeting held on 16 May 1991 were taken as read and signed. The President then unveiled a portrait of Professor W. T. Stearn, P.P.L.S. to general acclaim.

The Executive Secretary read for the third time the Certificates of Recommendation for the election of three Foreign Members and two Fellows *Honoris causa*. The President appointed as scrutineers Prof. B. G. Gardiner and Dr V. Southgate.

New Foreign Members and Members *Honoris causa* were elected at the Anniversary Meeting on 24 May 1991, as follows:

Prof. C. Kalkman, F.M.L.S.

Director of the Rijksherbarium, Leiden, Netherlands, succeeding Prof. Cornelius van Steenis, who was elected F.M.L.S. in 1960 and died in 1986. Author of *The Plant Diversity of Malesia* (1990), *Burseraceae of Malaysia*, a history of the Rijksherbarium and a number of other works, including 'Phylogeny of the Rosaceae' in the *Botanical J. Linn. Soc.* (98: 31–59).

Dr D. Zohary F.M.L.S.

Author (with M. Hopf) of *Domestication of Plants in the Old World: the Origin and Spread of Plants in West Asia, Europe and the Nile Valley* OUP, 1988. Other papers on plant genetics of e.g. *Onoclea* irises, chlorophyll lethal in *Dactylis* and transmission of supernumerary chromosomes in *Aegilops speltoides*. Basic studies on the evolution of plants under domestication and the origin of crop plants in the Old World. From Israel.

Prof. J. W. Hedgpeth, F.M.L.S.

Author of the *Treatise on Marine Ecology and Paleoecology*, editor of Rickett and Calvin's *Between Pacific Tides* and many other papers in marine biology, particularly on Pycnogonida (sea spiders), on which the only symposium ever held was at the Society on 7 October 1976, dedicated to Professor Hedgpeth and published in the *Zoological J. Linn. Soc.* (63: 1–237). Professor Hedgpeth is now retired and lives in California.

Dr. A. M. Bidder Fellow Honoris causa

Dr Bidder has made outstanding contributions to the teaching of zoology at Cambridge and to research into the biology of cephalopods, encapsulated in her co-authorship of 286 pages in the *Traité de Zoologie: V, Céphalopodes* (1989). Dr Bidder has also spent much effort in enabling women to resume their academic careers after family commitments.

Dr E. Trewavas Fellow Honoris causa

Dr Trewavas has had a distinguished career in ichthyological research spanning more than 50 years. A former Keeper of Zoology at the Natural History Museum, Dr Trewavas received the Society's Gold Medal for Zoology in 1969.

The following were elected to Council: Dr R. N. Bamber, Dr D. F. Cutler, Mr B. J. Ford, Dr P. M. Jorgensen and Dr C. A. Stirton. The Officers elected were: President, Prof. J. G. Hawkes; Treasurer, Prof. R. W. J. Keay; Zoological Secretary, Prof. J. Green; Botanical Secretary, Dr C. J. Humphries and Editorial Secretary, Dr D. F. Cutler.

The President read the citations for medals and awards as follows:

The Linnean Medal for Botany to Professor W. G. Chaloner, F.R.S.:

Professor William Gilbert Chaloner

Known affectionately as 'Bill' to his colleagues in the international biological community, William Gilbert Chaloner is one of the foremost botanists of his generation. His contributions, particularly in palaeobotany, palynology and evolutionary biology, together with his outstanding ability to communicate make him a worthy recipient of the Linnean Gold Medal.

Currently, Bill is the Hildred Carlisle Professor of Botany in the School of Life Sciences at Royal Holloway and Bedford New College, University of London. He holds a prominent position in World Botany, being a Fellow of the Royal Society, and a Corresponding Member of the Botanical Society of America, an honour limited to 50 living botanists in the world. In addition Bill is also Willmer D. Barrett Professor of Botany at the University of Massachusetts at Amherst. Over recent years he has held presidential office in our own Linnean Society of London, The International Organisation of Paleobotany and the British Palaeontological Association.

He has received a number of prestigious awards, including the International Medal of the Paleobotanical Society of India, the Medal for Scientific Excellence of the American Association of Stratigraphic Palynologists and recently (1990) he was elected Foreign Fellow of the Académie des Sciences (France). In other capacities he has served on a number of scientific committees as a Trustee to the Royal Botanic Gardens, Kew, The British National Committee for Antarctic Research, The International Geosphere-Biosphere program and has been a Chairman of the Fossil Plants Committee of the International Association for

Plant Taxonomy. On top of all that he has also served as Dean of the Science Faculty at Birkbeck College, University of London. Bill has served on a number of editorial boards including *Annals of Botany*, *Advances in Botanical Research*, *Paleobiologie Continentale*, *Journal of Historical Biology* and *Journal of Evolutionary Biology*.

After graduating with 1st class honours from the University of Reading, Bill Chaloner's Ph.D. research, under the supervision of Tom M. Harris, was the study of *in situ* spores of Carboniferous clubmosses. He has maintained a lifelong interest in Palaeontology as evidenced by more than 120 publications ranging from his one page letter to the editor of the *Geological Magazine* (95: 261–262) on the palaeoecology of fossil floras, as deduced from dispersed spores, to the impressive 367-page review of fossil lycopodes in the *Traité de Paléobotanique* (1967) and his editing of the 1004 page *Fossil Plants of the Carboniferous of Great Britain* (*Mem. Geol. Survey Palaeont.*, 4 (1–7), 1955–1967).

Spores have been a lifelong interest. Not only has he extracted ecological and historical information from the distributions of fossil pollen grains and spores, he has also studied their organic geochemistry and promulgated a number of hypotheses on their evolution. He has urged colleagues and students alike to compare dispersed spores with those found *in situ* within fructifications to emphasize the dynamic biological aspects of fossil spores in addition to the rather sterile geological/stratigraphic aspects that tend to dominate the palaeontological literature. Consequently, he has managed to illustrate the biological and ecological roots of palaeontology to stratigraphic palynologists by having a deep understanding of the systematics and palaeoecology of spores throughout the long-known history of spore-producing plants. Bill's 'classic' papers in this field include: 'The palaeoecology of fossil spores' (1968, In E. T. Drake (Ed.), *Evolution & Environment*), 'The evolution of Miospore polarity' (1970, *Geoscience & Man*), and 'The evolution of adaptive features in fossil exines' (1976: In Ferguson & Muller (Eds), *Evolutionary Significance of the Exine*).

In no way does Bill Chaloner restrict his studies to spores. For example, he has made a number of distinctive contributions to the biology, ecology and evolution of ancient plants and floras. For megafossils he has made significant contributions on many plants, ranging from the Devonian *Cyclostigma* (*J. Linn. Soc. Bot.*, 61: 25–36, 1968), through the Saudi Arabian Floras of the Carboniferous and Permian (see *Nature*, 285: 33–34, 1980, with A. A. El-Khayal and C. R. Hill) to the Mesozoic floras of Britain and Israel (see *Palaeontology*, 2: 236–242, with J. Lorch). His interest in the biology of whole plants and their evolution has led to several useful general reviews on palaeobiogeography, particularly of Carboniferous and Permian Floras (e.g. Chaloner & Lacey, *Spec. Pap. Palaeont.*, 12: 271–289, 1973 and Chaloner & Cox, 1987). Distinctive of his style was his first review on the rise of the land plants (*Biol. Rev.*, 45: 353–377), and more recently with A. Sheerin (*Spec. Pap. Palaeont.*, 23: 145–161, 1979). Both stand as classics on evolution of early land plants and the origin of tracheophyte characters. Other papers have detailed his interests in the atmospheric significance of Palaeozoic charcoal, and the climatic significance of trees growing above the Arctic and Antarctic circles.

Bill has always taken a deep interest in his students, many of whom have themselves subsequently produced major contributions. John Pettitt springs to mind, with whom Bill undertook innovative work on the evolution of the seed

(e.g. *Nature*, 198: 808–809, 1963), followed up more recently (Chaloner *et al.*, 1977), on the then earliest record of platyspermic seeds, from the Devonian of Ireland (*Nature*, 265: 233–235). With Creber & Francis, his developing work on growth rings in fossil and modern woods has clarified and enlarged our appreciation of the vexed question of how temperate plants could survive polar darkness in the Tertiary. Today, Bill is currently undertaking NERC-funded research on stomatal density in fossil leaves in order to track CO₂ changes, and NMR of fossil and living sporopollenin, as part of the new ‘biomolecular palaeontology’. Bill has a great gift for the English language. As most of this audience will know he is an enthralling and entertaining lecturer. He has given the annual addresses at both British Palaeontological Association and British Geologists’ Association meetings, invited papers at every International Botanical Congress since 1960, and a number of other invited lectures around the World. As President of the Linnean Society he hosted the bicentennial celebrations with grace and wit, including tea with the Queen. His after-dinner speeches are a pleasure to hear and the one he gave to more than 3000 delegates at XIV Botanical Congress in Berlin revealed an academic at peace with himself and on top of the world.

Bill Chaloner’s sense of priorities, his clarity of mind, combined with a balanced appreciation that some of the best science can come from looking at organisms in detail as well as examining the general properties of life make him the all round biologist many of us would like to emulate. He is a very convincing thinker and is responsible for persuading those around him of the values of his ideas. If I may add a personal note, Bill has been an example to me as my immediate predecessor as President. I am enormously grateful to him for his unobtrusive willingness to help at all times. Professor Bill Chaloner, I have the greatest pleasure in presenting you with the Linnean Medal for Botany for 1991.

The Linnean Medal for Zoology to Professor R. M. May, F.R.S.:

Professor Robert McCredie May

A scientist trained in theoretical physics may at first seem an unlikely recipient of the Linnean Medal for Zoology. But evolution does remarkable, inherently unpredictable things! Bob May was born in Sydney, Australia, and educated at Sydney Boys’ High School and at the University of Sydney, where he obtained a PhD in Theoretical Physics in 1960. After a brief interlude at Harvard University, he returned to Sydney and was rapidly promoted to the University’s first *Ad Hominem* Professorship of Physics. The metamorphosis from physics to biology can be traced to Bob’s introduction to the problem of the relationship between stability and complexity in natural communities, a problem to which he was able to bring an impressive range of skills and insights gained in physics and applied mathematics. One thing led to another, and by 1973 the transition was completed when he moved to Princeton University to take up the Class of 1877 Professorship of Zoology.

Two things in particular distinguish Bob May’s work in ecology from that of other mathematicians, physicists and theoreticians of various kinds who have made, and increasingly make, forays into the complexities of the living world.

One is a remarkable, intuitive and deep insight into the essence of biological problems, without any formal training in the subject. The second (which undoubtedly contributes to, and complements the first) is a willingness to seek out biological colleagues of the highest calibre and to forge highly effective friendships and working partnerships with them. The result has been a series of pioneering studies in ecology, evolutionary biology and parasitology, to name but three areas that have fundamentally altered the way in which biologists think about, interpret and study the complexities of nature. The award of the Linnean Society's Medal for Zoology is just recognition of this enormous contribution to the subject.

A complete summary of his many contributions is not possible in a brief citation. The highlights must suffice. As well as his fundamental work on the theory of diversity and stability, a second outstanding contribution was to draw attention to the importance of chaotic dynamics in populations and assemblages of species, pointing out how incredibly complicated patterns of population fluctuations could arise from the simplest of systems. This work played a major part in drawing the importance of chaotic dynamics to a wider scientific community outside biology. His current research deals with forecasting in chaotic systems, with the effects of spatial heterogeneity upon host-parasitoid systems, and with evolutionary and dynamic aspects of the interactions between parasites—broadly defined to include viruses, bacteria, protozoa and helminths—and their hosts, with special emphasis on the role of infectious diseases in the regulation of natural populations of plants and animals.

Particularly appropriate in our context, Bob is also passionately concerned with factors influencing the diversity and abundance of species, not least the central question of how many species share the planet with us, and why it is this number, and not an order of magnitude more, or less. Unlike many bold scientific questions, this is one with a strict time-limit on it, because growing human pressures on the world's flora and fauna threaten to obliterate the very raw material of our science. Bob May has played, and continues to play a major political as well as a scientific role in drawing attention to the importance of biodiversity to the general public and to politicians and other policy makers.

His published output in biology is prodigious, and includes six books (as an author, co-author or editor), about 50 book chapters and well over 100 papers. He has also written over 100 'News and Views' articles in *Nature*, thus displaying a willingness to interpret and publicize science, and an ability to write about it in a lucid and lively fashion that few can equal.

None of this prodigious scholarly output has been bought at the expense of service to the greater scientific community. Among his many administrative tasks, he was Vice President for Research at Princeton University for 11 years, a Council Member of the Smithsonian for 6 years, and a member of various committees and study groups of the U.S. National Academy of Sciences. He is currently a Trustee of the Natural History Museum, here in London, a Trustee of the Worldwide Fund for Nature, a member of the Joint Committee of the Nature Conservancy Councils, a member of the National Radiation Protection Board, and the President Elect of the British Ecological Society.

Honours and awards are many. Bob was elected a Fellow of the Royal Society in 1979, and was selected to give the Croonian Lecture—the Royal Society's major annual lecture in Biological Sciences—in 1985. He received the

MacArthur award in 1984 from the Ecological Society of America, and has Honorary Degrees from the City University in London, and Uppsala University in Sweden.

His recent burst of activity in British ecology and British institutions was made possible by a move from Princeton to take up a Royal Society Research Professorship jointly between Oxford University and Imperial College in 1988. On good authority, the move from Princeton to Britain was motivated by the belief that diversity in one's life is as desirable as it is in ecosystems! Before moving to Britain, Bob bought the complete set of ordnance survey maps, and with his wife, Judith, aims to use every one of them exploring the British countryside. Biology's gain is physics' loss. Over the last year or so Bob May has been particularly helpful in furthering the efforts of the Linnean Society and the Systematics Association to emphasize the need for further resourcing of systematic research. I am personally particularly grateful to him for this and have the greatest pleasure in presenting him with the Linnean Medal for Zoology for 1991.

The H.H. Bloomer Award to Mr H. D. Wilson:

Mr Hugh Dale Wilson

Hugh Wilson is one of New Zealand's outstanding field botanists. His botanical and biological work over the past 20 years has reached an exceptionally wide audience through his great ability to communicate at a variety of levels: as research scientist; as National Park naturalist giving illustrated talks and guided tours; as mountaineer; as botanical artist; as lecturer, author, reviewer and newspaper columnist. He continues to make distinctive contributions to increasing public awareness of the need for the conservation of New Zealand plants and of their habitats. What makes his continuing work in New Zealand botany exceptional is that it has largely been achieved outside either University or Government-sponsored scientific agencies. Wilson works with the dedication of the true naturalist who seeks only to understand and to record and to make his knowledge freely available to others.

Hugh Wilson was born in the South Island of New Zealand in 1945, within sight of the mountains that have formed a background for most of his life. He was educated at St Andrew's College, Christchurch, and at Canterbury University. Between school and university he taught for a year in Sarawak, subsequently writing a book on his experiences (*The Year of the Hornbill*). In the 1960s he climbed widely in the Southern Alps, especially in the high alps of Canterbury, and was an active member of the Canterbury Mountaineering Club, contributing many finely written articles to the *Canterbury Mountaineer* and to the *New Zealand Alpine Journal*. He has travelled and climbed in the Andes and in North America, where he has also lectured to botanical societies. The plants, people and wildlife of Tasmania, Australia, Fiji and Tahiti have also lured him, but he loves particularly to explore his own country, preferably on bicycle and foot.

After university, he was able to indulge his love of mountains, their flora and fauna, and a developing skill as a botanical artist during his period as Park

Naturalist at Mount Cook National Park. There he shared his knowledge of high alpine vegetation with a wide and varied public who came to appreciate his lively lectures at the Park Information Centre. This work led to a major botanical survey of Mt Cook National Park, painstaking work over many seasons which culminated in a comprehensive survey of all plant groups in the Park, published as *The Vegetation of Mt Cook National Park* in 1976. Other major vegetation surveys followed; five years in Stewart Island with the *Vegetation of Stewart Island* published in 1987, and he is currently writing up a detailed vegetation survey of Banks Peninsula.

Always fully aware of the need to communicate to the layman a sense of awareness of the changing pressures which plants and their habitats face in wilderness and other areas in New Zealand, Hugh Wilson conceived the idea of producing simple, clearly written, well illustrated field guides to the vegetation of areas where he has collected extensively. His two volumes so far: *Wild Plants of Mt Cook* (1978), and *Stewart Island Plants* (1982), both illustrated by his delightful drawings, are mines of information for the layman and serious botanist alike. In his work Wilson displays a zeal and a commitment to the identification and protection of New Zealand's indigenous flora and vegetation, work which is supported solely by small grants or contributions from friends and colleagues. Any profits from the field guides are used to finance the next volume in the series. He is selfless in contributing articles, reviews and illustrations to a variety of publications dealing with New Zealand wildlife including the *Canterbury Botanical Society Journal* and the *New Zealand Botanical Society Newsletter*, and he has contributed significant plant collections over the years to New Zealand's National Herbarium at Lincoln. Currently, he is closely involved in management of the Hinewai Reserve on Banks Peninsula which he helped to set up in 1987 for the protection and restoration of native vegetation and wildlife.

In 1987 Hugh Wilson was awarded the Loder Cup by the Minister of Conservation for his sterling efforts to encourage the protection and cultivation of the native flora of New Zealand. He is a worthy recipient of the H.H. Bloomer award.

Unfortunately Hugh Wilson is unable to be with us today but means will be found of presenting the Medal to him in due course in his own country.

The Jill Smythies Award to Ms D. E. Evans:

Dale Evans

Dale Evans is both a scientist and a botanical illustrator. She took her B.Sc. in Botany and Zoology at the University College, Swansea, and City and Guilds in Botanical Illustration, a Diploma of the Society of Industrial Artists and Designers and an M.A. in Graphic Design from Manchester Polytechnic.

In 1982 she joined the staff of the Botany Department in the National Museum of Wales and there set about painting large numbers of plant portraits and plant compositions. Some of these have been published in the form of Wallcharts (on Mosses and their habitats, Plants of the Mountains, Woodland Ferns), Notelets illustrated by Ferns and Fungi and illustrated covers of Museum publications. She has also had several Wallcharts published by The Natural

History Museum and the Botanic Gardens Conservation Secretariat, with work in progress for the National Museum of Wales on compositions of vegetation reconstructions of Snowdonia as it was 9000 years ago.

During her time at the National Museum of Wales, Dale Evans has also researched and designed several projects relating to exhibitions in the Museum. This has involved another of her talents, that of plant modelling.

Dale Evans is now a freelance artist and is working on several projects for the National Museum of Wales, in addition to children's books and private clients.

She has an exhibition now touring as part of the South-East Wales Art Association's exhibition of Moving Pictures. This is an educational exhibition showing stages from preliminary work to the final product and is being shown in public places outside the usual Art Gallery circuit. She has just become an Associate Member of the Water Colour Society of Wales.

Dale Evans is a worthy recipient of the Jill Smythies Award for her extensive published Botanical Illustrative work.

The Bicentenary Medal to Dr D. Rollinson:

David Rollinson

David Rollinson was born in Yorkshire and after schooling at Huddersfield and Hertford he embarked on a traditional course in Zoology at University College, Cardiff. It was at Cardiff under the supervision of Professor A. Erasmus that David Rollinson had the opportunity of hands on experience with freshwater snails and schistosomes during his honours project. It is likely that at the time he had absolutely no idea how important molluscs and schistosomes would be to his subsequent career.

Indeed, his doctoral studies at Imperial College at Silwood Park were on 'Biochemical and biological characters of *Eimeria* species', protozoan parasites, under the supervision of Professor Elizabeth Canning. It was during this early phase of his scientific career that David became familiar with the use of enzymes as powerful taxonomic tools for studying population genetics. The move to Silwood Park was important from two aspects: it enabled his interest in parasitology to flourish, and he also met his wife, Elizabeth, herself a distinguished botanist and virologist.

On leaving Imperial College, David took up an appointment in 1976 as a Higher Scientific Officer in the Experimental Taxonomy Division of The Natural History Museum where he worked with the late Dr Christopher Wright, Dr David Brown and Dr Vaughan Southgate. His subsequent application of experimental techniques to taxonomic problems has been very productive. He has authored or co-authored 85 original scientific papers, co-edited three books and secured external funds for his research work from a variety of sources, including NERC, World Health Organisation, The Wellcome Trust and the European Community. Collaboration with other groups in Europe and Africa has been extremely beneficial, for example, the co-supervision of Tina Walker with Andrew Simpson (National Institute of Medical Research, Mill Hill) on the differentiation of schistosomes using cloned DNA probes resulted in the first introduction of molecular biology into the Natural History Museum. These

techniques have also been applied to bulinid snails with success in differentiating different populations. Present activities are directed towards unravelling the relationships of different species and strains of schistosomes by gene sequencing.

There is no doubt that David has made a significant contribution to the understanding of the population genetics of freshwater snails, particularly of the genus *Bulinus*, and the biology of schistosomes. David is a biologist who enjoys his feet wet. He has been on eleven major field excursions mainly in Africa and islands off the African coast, to collect schistosomes and their snail hosts to add to the extensive live collections in London. It is these collections that provide the backbone for the sophisticated experimental work, ranging from reproductive behavioural studies to molecular biology. The combination of field studies with laboratory experimental work has repeatedly proved extremely valuable in furthering our understanding of the biology of schistosomiasis.

Somehow David finds time also for a number of leisure activities. A Museum obsession for collecting spills over into the world of pot lids. Apparently it is not uncommon to see David slip out to one of the major auction houses in South Kensington to bid for a particular lid to add to his collection. There must be something of the business man in him because you may well come across him manning a stall at a local antiques fair selling unwanted parts of his collection. However, as those who have observed him haggling in an African market will attest, it is unlikely that anyone is going to come away from his stall with a bargain! One of the characteristics of David's writing is logic and clarity of thought, therefore it comes as no surprise that these attributes are made full use of by his county in chess tournaments. Anyone fortunate enough to sample the Rollinson punch on New Year's Day will know that his bench skills are put to good use also in the home environment.

Several scientific societies including the British Society for Parasitology and the Royal Society of Tropical Medicine and Hygiene have benefited from David's industrious work, output and wisdom. Many will recall the role he played in joint meetings of the Linnean Society and other scientific societies during our bicentenary celebrations. It is therefore a great pleasure for me to award the Bicentenary Medal for 1991 to David Rollinson.

Treasurer's Report

Audited Accounts for 1990

May I draw your attention first of all to the Income and Expenditure Account on page 2? The Income side shows a substantial increase on the previous year (1989), due largely to three items: (a) dividends and interest benefited for the first time from a full year's income from Professor Irene Manton's generous bequest; (b) our rooms are being used almost to capacity by other societies; and (c) there is a new item—Facility Fees (£5448). This latter represents fees paid by firms to photograph and publish material from our Library; for this we have, on the recommendation of the Library Committee, adopted a scale of charges which we believe to be reasonable and competitive; they help to cover some of our costs in the Library.

When I presented the 1989 Accounts last year I explained that the substantial increase in Expenditure, compared with 1988, was largely due to staff changes

and difficulties. I was, however, sufficiently confident to predict that expenditure on Salaries, Recruitment and Financial Services would be significantly less in 1990. I am pleased to say today that, as you will see from the Accounts, my prediction has proved to be correct.

Under Expenditure you will note that we have, for the first time, identified as separate headings (a) catering (previously distributed among other items) for scientific meetings, committees, receptions and the like, and (b) cleaning and refuse disposal (previously included partly in Salaries and partly in General Rates).

The net result of this increased Income and decreased Expenditure is a very healthy increase from £24,930 to £52,519 in the surplus. These figures appear again in *Note 3*, General Fund from which transfers of £20,000 and £6000 have been made to Provisions for Repairs and Improvements and for Special Library Expenses respectively.

We continue to be much indebted to our Editors and Publishers, and to all who contribute papers to our journals, for the healthy state of our Joint Publishing Account (page 5). Subscriptions by libraries both in the U.K. and overseas have kept up well. We need to remember, however, that under our Royal Charter and charity law, profits from our publications should be applied to the Object of the Society, namely 'the Cultivation of the Science of Natural History', and not to subsidize the annual contributions of Fellows.

You will note that the Market Values of our Investments on 31 December 1990 were substantially down on the previous year. This was because of the state of the stock market. In past months the market has improved considerably and I am pleased to report that a valuation as at 20 May 1991, which I have just received from our stock brokers, shows the total market value of General Funds to be £874,803 and of Trust and Special Funds to be £163,491. I should also report to Fellows that, after taking advice from our stockbrokers and from our colleague Roger Goodenough, Council accepted a recommendation from the Finance Committee that we should transfer the capital of our Trust and Special Funds from M & G Charifunds, which have not been performing at all well, to a balanced portfolio managed by our brokers James Capel.

R. W. J. KEAY

The meeting accepted the recommendation of the Audit Review Committee proposed by Mr Wilding, that the Accounts for 1990 be approved.

Balance Sheet and Accounts 31 December 1990

Executive Secretary's Report

At the beginning of the year, or rather part way through it, the Society faced three significant possible difficulties. They were the three Cs—cleaning, computers and Charles. Of these, the first was occasioned by the failings of a contract cleaning company, which has been replaced with a part-time cleaner, who does a marvellous job. The computers have been replaced (see below) and

HRH The Prince of Wales has been and gone, apparently none the worse for the experience. The Society has successfully coped with all three; it has been delighted to welcome Prince Charles and hopes that this will not be the last time. One of the policemen remarked during the obligatory search of the premises before the royal visit "a bomb going off in here isn't going to make a lot of difference". Lest members take umbrage at the implications of this statement for the Society, let me hasten to add that the remark was directed towards the structure of the Society's basement.

1. *Staffing*. There have been no changes in staff in the past year. The Society receives help from some students during vacations, who have proved extremely useful in carrying out work on the premises and in the Library. There is no doubt that the rising interest in systematic biology, as evinced, for example, by the taxonomic initiative, has placed additional burdens on the Society's staff who have also had to cope with many more meetings in the Society's rooms, too. At least some people come back for more meetings, which must be a positive sign.

2. *Plant*. The policy of regular maintenance of equipment does seem to be paying off, with fewer failures and more reliable facilities. Both air conditioning units are working, although we shall not know whether the problems encountered with the Meeting Room plant have been solved until after the summer (when there is no heating, only cooling). The boilers have been thoroughly serviced with the circulating pump (which had run for 18 years without attention) and asbestos has been removed from the boilerhouse. The radiator system has been cleaned.

A rolling stack system has been installed in the East Basement and the room redecorated. This should enable us to move quite a lot of the books in the open areas of the basement during the summer.

The Library annexe has been redecorated, which is the only major refurbishment planned in the 1991 financial year.

The computers purchased over a period from 1984 have been replaced. A small network of three machines, with provision for a fourth, has been installed in the office, and a separate machine in the Library. Our data, including membership, has transferred well. Whilst there has been an inevitable loss of service as our learning curve has risen, the transition has been remarkably smooth. The network enables documents to be transferred from one person to another with ease. The new machines are much faster and convenient than the earlier machines, which were beginning to experience severe operating difficulties. The maintenance costs have been cut from £2600 to £450 pa. The addition of a tape streamer, which backs up all information in the office every other day, gives us an added security in case of failure. No further exotic office equipment has been acquired in 1990.

The Society now possesses three carousel projectors, which are serviced annually. There are also two large portable screens, which allow the Council Room to be used for occasional meetings with AVA equipment. The overhead projector has had a service, which has improved it immeasurably. In London, fine particulate dust (from car exhausts) is a continual problem, and warrants the regular cleaning of equipment. The PA system can be connected to almost anything, including the ubiquitous Walkman.

It is clearly prudent to economise where possible on the use of energy. To a

small extent this is enforced by powercuts, which have become a feature of London W1, and are causing some concern. But in an old building economies are not easy. For example, the Council Room lights consume 2.5 kW when on, which accounts to some extent for its overheating in use. In the Library, low consumption lights have reduced the consumption by around 80%, but this is not an option for the spotlights in the Council Room. The air conditioning unit for the Meeting Room needs a time clock to enable it to be programmed weekly, as does the back-up hot water system for the toilets in the summer. Only a single boiler is needed for much of the winter, and the water temperature can also be controlled. Any ideas for energy saving would be welcome.

3. Meetings. Attendance at meetings has been variable in the sense that evening meetings have been badly attended (average 20) whilst day meetings attract audiences averaging 80. The annual regional meeting, the first, at Reading attracted 100 participants. Next year, we hope to introduce plenary lectures after day meetings for all Fellows to attend without payment. We will also try better promotion, although there is little evidence that this makes much difference. Members are encouraged to bring guests.

Those attending meetings of the Society's committees can expect hospitality, which seems only reasonable for members and others giving their time for nothing. All members should take advantage of coffee or tea when they visit the Society's rooms.

JOHN MARSDEN

The President then gave his address: Speciation and the Origin of Biological Diversity. A motion of thanks was moved by Prof. Hawkes, seconded by Prof. Gardiner, requesting that the address be published. The President thanked all those members of the Society, the Council and his fellow Officers, particularly the retiring Editorial Secretary, Professor Pye, for their invaluable assistance during his term of office and handed over to his successor, Professor Jack Hawkes. The new President, Professor Hawkes, drew members' attention to forthcoming meetings of the Society before appointing as Vice-Presidents Dr Humphries, Dr Joysey, Prof. Lucas and Dr Southgate. He then declared the meeting closed.

Officers, Council and Committees 1991–92

PRESIDENT Professor J. G. Hawkes

VICE-PRESIDENTS
 Dr C. J. Humphries
 Dr K. A. Joysey
 Professor G. Ll. Lucas
 Dr V. R. Southgate

TREASURER Professor R. W. J. Keay (1989)

SECRETARIES
Botanical Dr C. J. Humphries (1990)
Zoological Professor J. Green (1988)
Editorial Dr D. F. Cutler (1991)

COUNCIL: The President, Treasurer, Secretaries and:
 Miss C. E. Appleby + Dr D. Galloway
 – Dr R. N. Bamber + Dr P. A. Henderson
 + Professor J. A. Beardmore – Professor P. M. Jorgensen
 + Dr P. E. Brandham ○ Dr G. McG. Reid
 + Dr D. Edwards ○ Dr P. R. Richards
 Dr Y. Z. Erzinclioglu + Dr V. R. Southgate
 – Mr B. J. Ford – Dr C. H. Stirton
 + Mrs P. D. Fry

+ Due to retire 28 May 92
 Due to retire 24 May 93
 – Due to retire 24 May 94

Dr C. J. Humphries is the observer of the Systematics Association; the BES observer is Dr B. W. Turner (1988).

EXECUTIVE SECRETARY	Dr J. C. Marsden (1989)
LIBRARIAN & ARCHIVIST	Miss G. L. Douglas (1983)
MEMBERSHIP OFFICER	Miss M. J. Polius (1989)
MEETINGS OFFICER	Miss M. J. Baird (1990)
HOUSEKEEPER/	
LIBRARY ASSISTANT	Mrs E. Dimitrova (1990)

APPOINTMENTS

Committee Chairmen

Collections Curatorial	Dr K. A. Joysey (1968)
Editorial	The Editorial Secretary (e.o.)
Finance	The Treasurer (e.o.)
Flora Europaea Trust	The Botanical Secretary (e.o.)
Grants	The President (e.o.)
Library	Prof G. Ll. Lucas (1975)
Medals and Awards	The President (e.o.)
Programmes	The Zoological and Botanical Secretaries (e.o.)

Curators

Fish, Shells & General Zoology	Mr A. Wheeler (1973)
Insects	Dr M. G. Fitton (1976)
Plants	Dr C. E. Jarvis (1990)

Editors

Biological Journal
Botanical Journal

Zoological Journal
Synopses Series

The Linnean
Reviews

Dr D. R. Lees (1990)
Dr S. L. Jury (1985)
Dr D. Edwards (1991)
Dr D. B. Norman (1989)
Dr D. M. Kermack (1980)
Dr J. H. Crothers (1991)
Prof B. G. Gardiner (1980)
Professor J. G. Vaughan (1990)

Specialist Group Secretaries

Biogeography
Bryology—correspondence
Computer Applications
Freshwater
Meiofauna
Palaeobotany
Palynology
Plant Anatomy

Dr I. B. K. Richardson (1983)
Mr J. H. Field (1983)
Dr F. A. Bisby (1984)
Dr K. T. O'Grady (1986)
Dr H. M. Platt (1987)
Dr A. R. Hemsley (1991)
Mrs M. M. Harley (1990)
Dr D. F. Cutler (1973)

†*COLLECTIONS CURATORIAL* (15)

Dr K. A. Joysey (Chairman; 1968)
Dr F. R. Barrie (1990)
Mr P. S. Davis (1985)
Dr M. G. Fitton (1980)
Dr C. E. Jarvis (1985)
Mrs S. Morris (1980)
Dr N. K. B. Robson (1977)
Dr M. J. Scoble (1990)
Mr A. Wheeler (1973)
The Librarian (e.o.)

†*LIBRARY*

Prof G. Ll. Lucas (Chairman: 1975)
Mr R. E. R. Banks (Vice Chairman; 1985)
*Mr J. Collins (1990)
Prof P. M. Daniel (1987)
*Mr R. G. C. Desmond (1976)
*Miss S. M. D. Fitzgerald (1985)
Mr B. J. Ford (1990)
*Mrs S. Gove (1984)
*Miss J. Sheppard (1985)
Prof W. T. Stearn (1988)
Mr D. P. Taylor-Pescod (1985)
Dr P. F. Yeo (1987)

†*EDITORIAL COMMITTEE*

The Editorial Secretary (e.o.)
Prof B. W. Fox (1989)
Mr C. M. Hutt (1989)
Dr V. R. Southgate (1988)
The Editors (e.o.)
The Editor, *J. Zool*
(Dr M. Edwards: e.o.)
*Miss Joan Fujimoto
*Dr A. Richford
*Ms B. Sharma
*Dr R. S. K. Barnes (ECSA)
Dr S. Blackmore (Syst. Assoc.)

†*PROGRAMMES COMMITTEE*

The Zoological Secretary (e.o.)
The Botanical Secretary (e.o.)
Dr J. H. Crothers (1984)
Dr M. A. Edwards (1991)
Mrs P. D. Fry (1991)
Mrs V. M. Purchon (1986)
Dr D. Rollinson (1988)
Dr S. M. Tilling (1988)
Dr M. W. Trett (1991)
The Specialist Group Organisers by
invitation

FLORA EUROPAEA TRUST

The Botanical Secretary (e.o.)
Dr S. L. Jury (1Z991)
Dr J. R. Edmondson (1990)
Dr S. M. Walters (1977)
The President (e.o.)
The Treasurer (e.o.)

†*FINANCE*

The Treasurer (e.o.)
Mr F. R. Goodenough (1975)
Dr C. B. Goodhart (1975)
Mr B. H. Harley (1990)
The Chairman of the Library
Committee (e.o.)

†GRANTS

The President (e.o.)
 The Vice Presidents (e.o.)
 Dr S. A. Churchfield (1986)

†MEDALS AND AWARDS

The President (e.o.)
 The Vice Presidents (e.o.)
 Botanical Members of Council present
 Zoological at the January Council
 Meeting

*Informal Panels****JILL SMYTHIES AWARD***

The Botanical Secretary (e.o.)
 Mr F. H. Brightman (1989)
 Prof B. W. Fox (1989)

DENNIS STANFIELD AWARD

Dr P. Denny (1989)
 Dr R. W. J. Keay (1972)
 Dr R. M. Polhill (1985)

EXPEDITIONS

Dr L. M. Cook (1990)
 Dr D. J. Galloway (1990)
 Dr R. W. J. Keay (1990)
 Mr M. J. S Sands (1990)

†The Officers are *ex officio* (e.o.) members.

*Not Members of the Society

The Linnean Society of London
Balance Sheet
31 December 1990

<i>31st December 1989</i> £ 581,138 ASSETS Investments (as per schedule) (Market Value: 31st December 1990; £789,163) (Market Value: 31st December 1989; £887,172) Sundry Debtors Deposit and Current Account balances <hr/> 673,782	£ 606,672 <hr/> 109,013 21,031 <hr/> 736,716
--	---

Less: Current Liabilities	
26,553	Contributions received for future years
74,338	Provision for Repairs and Improvements (Note 1)
11,001	Provision for Special Library Expenses (Note 2)
28,323	Sundry creditors and provisions
<hr/>	
140,215	
<hr/>	
533,567	
<hr/>	
Trust and Special Funds	
80,320	Investments (as per schedule)
	(Market Value: 31st December 1990; £155,158)
	(Market Value: 31st December 1989; £200,610)
26,072	Deposit and Current Account balances
<hr/>	
106,392	
<hr/>	
£639,959	£791,050
<hr/>	<hr/>

Represented by:	
General Funds	
516,040	General Fund (Note 3)
17,527	Publications Fund (Note 4)
<hr/>	
533,567	
<hr/>	
Trust and Special Funds	
106,392	Balance of Funds
<hr/>	
£639,959	£791,050
<hr/>	<hr/>

R. W. J. Keay	Treasurer
R. Wilding	
W. A. Graham-Kerr	Audit Reviews Committee
M. F. Claridge	
J. G. Hawkes	24 April 1991
J. Beardmore	

Report of the Auditors to the Fellows of The Linnean Society of London

We have audited the Financial Statements on pages 1 to 9 in accordance with auditing standards.

In our opinion the Financial Statements give a true and fair view of the state of the Society's affairs at 31st December 1990 and of its results and source and application of funds for the year ended on that date.

4, London Wall Buildings
LONDON EC2M 5NT.
24th April, 1991

FRASER & RUSSELL
Chartered Accountants

Income and Expenditure Account for the year ended 31 December 1990

1989	INCOME	£
£58,069	Annual contributions received	61,580
799	Income tax recoverable on covenanted contributions (year to 5th April 1990)	555
39,836	Dividends and interest	45,709
2,444	Transfer from Minchin & Jane Jackson Funds	2,211
4,704	Publications—sales of back issues	2,429
1,204	Donations received	921
7,661	Use of rooms	11,103
10,970	Facilities of Premises	13,860
1,991	Miscellaneous receipts	1,149
2,880	VAT recoverable	3,140
90	Royalties	239
51,709	Publications (Note 8)	53,455
—	Facility Fees	5,448
<hr/> £182,357		<hr/> £201,799
EXPENDITURE		
5,852	Scientific Meetings	7,185
1,077	Medals	464
5,609	Library—books and periodicals	4,238
1,664	binding repairs and cleaning of books	691
2,089	cataloguing	3,623
7,323	Newsletter ('The Linnean')	6,431
2,730	The List and By Laws	—
77,864	Salaries and National Insurance	67,558
6,077	Staff Recruitment Costs	40
10,214	Financial Services (including audit fees)	9,140
9,544	Printing, stationery, postage and telephone	9,750
1,286	Photocopying	1,658
600	Office Equipment	3,042
8,324	General Rates	5,289
6,605	Electricity and Gas	6,773
4,769	Repairs, Renewals and Insurance	6,400
1,763	Expenses of Officers and Council	1,868
—	Catering	4,025
4,037	Miscellaneous	7,026
—	Cleaning and refuse disposal	4,059
<hr/> £157,427		<hr/> £149,280
<hr/> £24,930	Excess of Income over Expenditure for the year	<hr/> £52,519

Notes to Accounts—31 December 1990

	<i>1989</i>	
	£	
Note 1		Provision for Repairs and Improvements
77,211	77,211	Balance at 1st January 1990
—	—	Increase in provision
(2,873)	(2,873)	Expenditure during year
	£74,338	Balance at 31st December 1990
	£72,151	

Note 2		Provision for Special Library Expenses
16,358	16,358	Balance at 1st January 1990
—	—	Increase in provision
(5,357)	(5,357)	Expenditure during year
	£11,001	Balance at 31st December 1990
	£14,481	

Note 3		General Fund
24,930	24,930	Excess of Income over Expenditure for the year
44,141	44,141	Realised net gains on changes in investments during the year
150	150	Composition fees received during the year
100,000	100,000	Irene Manton Estate—interim distributions
19,563	19,563	Transfer from Bicentenary Expenses Provision
—	—	Transfer to Provision for Repairs and Improvements
—	—	Transfer to Provision for Special Library Expenses
(24,996)	(24,996)	Transfer to Irene Manton Special Fund*
352,252	352,252	Balance at 1st January 1990
	£516,040	Balance at 31st December 1990
	£578,017	

*This transfer reflects the part of the legacy designated for the capital of the prize fund by Council in accordance with the provisions of the Will.

Note 4		Publication Fund
19,129	19,129	Balance at 1st January 1990
2,780	2,780	Transfer from Joint Publishing Account (Less due to other Societies £22)
21,909	21,909	
4,382	4,382	<i>Less:</i> Transfer to Publications Account
	£17,527	Balance at 31st December 1990
	£17,704	

Note 5 No value is attributed to the Library, furniture, office equipment and stock of unsold journals in this Balance Sheet. Costs of acquisitions are written off as incurred.

Note 6 Annual contributions in arrears at 31st December 1990 amounted to £7,996 (31st December 1989: £3,916; 64% of this was paid in 1990)

Note 7	Publications Account	
	Half share of surplus on 1990 Joint Publishing Accounts—Journals	116,354
98,001		4,426
4,382	Transfer from Publications Fund	(14,859)
832	Synopses including purchase from E. J. Brill	
<hr/>		
103,215		105,921
<hr/>		
	<i>Less:</i>	
	Contributions to Joint Publishing Account and distribution cost for Journals—Fellows	46,143
48,524		6,323
2,982	Editorial expenses	
<hr/>		
51,506		52,466
<hr/>		
£51,709	Surplus transferred to Income and Expenditure Account	£53,455
<hr/>		

**Joint Publishing Account with Harcourt Brace
Jovanovich Ltd.**
**Income and Expenditure Account for the
Publishing Year ended 31 December 1990**

1989			
£		£	£
	Sales—		
363,110	Journals (including Linnean Society contributions)	391,813	
13,773	Books	9,887	
<hr/>			
£376,883		£401,700	
<hr/>			
5,006	Stock at 1st January 1990		—
	Production Costs:—		
167,108	Journals	159,105	
3,145	Books	636	
<hr/>			
175,259		159,741	
—	<i>Less:</i> Stock at 31st December 1990		—
<hr/>			
£175,259		£159,741	
<hr/>			
	Gross Profit for year—		
100,812	Harcourt Brace Jovanovich Ltd.	120,979	
	Linnean Society—		
98,001	Journals	116,354	
2,811	Books: Publications Fund	4,626	
<hr/>			
100,812		120,980	
<hr/>			
£201,624		£241,959	
<hr/>			

Trust and Special Funds for the year ended 31 December 1990

Deposit and current account balances at 1 January, 1990	Income			Expenditure			Deposit and current account balances at 31 December, 1990	Investments at book value £
	Dividends interest and income tax recovered	Investment sales royalties or other receipts	Grants, awards transfers and sundry expenses	Purchase of investments	Administration contribution	£		
Flora Europaea Trust Fund								
Westwood Fund	1,141	1,222	16,021*	446	223	£ 6,633		4,010
Trail—Crisp Fund	403	188	2,759	2,774	20			2,910
Hooper Fund	357	124	1,960	1,960	15			1,975
Goodenough Fund	1,780	376	4,455	4,455	39			4,489
Minchin Fund (Note)	466	335	5,141	4,941	—			4,978
Jane Jackson Fund (Note)	47	42	666	42**	—			671
The H.H. Bloomer Fund	2,397	2,169	34,326	34,326	—			34,588
P. Appleyard Fund	1,225	511	6,235	461	6,260	49	1,201	6,504
Dennis Stanfield Memorial Fund	8,565	2,437	31,129	5,001	33,246	262	3,622	34,732
Omer—Cooper Award	3,470	654	10,423	7,582	6,059	53	853	6,179
Bonhote Fund	3,686	2,227	23,436	1,032	23,970	181	4,166	28,419
Jill Symthies Award Fund	2,561	1,006	13,084	2,407	13,181	109	954	14,059
Irene Manton Prize Fund	(26)	352	6,248	653	5,948	17	(44)	6,440
	—	2,072	22,743	1,139	22,743	—	933	22,916
	£26,072	£13,715	£178,626	£31,568	£160,974	£968	£22,459	£172,870

**Income for this year transferred to General Account.

Note- Income accounted for
in the General Fund in
1989 but not paid from the
Special Funds until 1990

(2,444)
£23,628

*2,549 Royalties
13,472 Sales of Investments
£16,021

Schedule of Investments 31 December 1990

Nominal	General Account	Book Value	Market Value
		£	£
£25,000	Treasury 9% Stock 1994	21,637	23,627
£27,500	Conversion 10% Stock 1996	26,868	26,659
£27,500	Exchequer 10 1/2% Stock 1997	28,092	27,838
£27,250	Treasury 10 1/2% Stock 1999	27,148	26,812
58,000 Units	Allied Dunbar UT European Growth Trust	15,196	11,612
14,874 Shares	Attwoods 5p Ordinary Shares	30,791	32,277
8,282 Shares	Barclays Bank Plc £1 Ordinary Shares	10,217	29,981
3,500 Shares	Bass 25p Ordinary Shares	35,933	36,715
4,250 Shares	B.A.T. Industries Plc 25p Ordinary Shares	3,397	24,523
8,000 Shares	Boots Co. Plc 25p Ordinary Shares	10,475	25,600
7,300 Shares	BTR Plc 25p Ordinary Shares	22,037	23,433
739 Warrants	BTR Plc for Ordinary Shares	410	337
5,500 Shares	Cable & Wireless 50p Ordinary Shares	20,428	24,420
6,000 Shares	Cadbury Schweppes Plc 25p Ordinary Shares	4,620	19,140
3,990 Shares	Commercial Union Assurance Co.	12,934	18,234
4,700 Shares	Fisons 25p Ordinary Shares	18,227	17,343
10,350 Shares	General Electric 5p Ordinary Shares	24,992	17,543
3,800 Shares	Glaxo Holdings Plc 50p Ordinary Shares	1,287	32,205
8,000 Shares	Glynwed International 25p Ordinary Shares	24,999	17,440
1,250 Units	GUS "A" Ordinary Stock	7,700	13,313
15,100 Shares	Hanson Trust Plc 25p Ordinary Shares	18,920	27,860
28,000 Units	Henderson UT Management European Income Trust	14,476	14,725
12,000 Shares	Inchcape 25p Ordinary Shares	28,906	28,080
4,490 Shares	Marks & Spencer Plc 25p Ordinary Shares	9,324	9,990
£20,000	J. Sainsbury Plc 8 1/2% Conversion Bonds	20,203	20,226
£11,000	Scottish Mortgage & Trust Plc 8-14% Stepped Deb.	11,083	12,518
11,000 Shares	Sedgwick Group 10p Ordinary Shares	27,017	26,290
6,870 Shares	Shell Transport & Trading Co. Plc 25p Ordinary	8,330	31,464
2,854 Shares	Smithkline Beecham 25p 'A' Ordinary Shares	10,869	18,051
9,000 Shares	Tarmac 50p Ordinary Shares	29,008	22,320
10,730 Units	The Equities Investment Fund for Charities	16,711	52,705
9,600 Shares	Trust House Forte 25p Ordinary Shares	27,940	23,520
4,745 Shares	Unilever Plc 5p Ordinary Shares	16,543	32,408
	Uninvested cash held by James Capel	10,749	10,749
		597,467	779,958
	National Savings Bank—Investment Account	9,205	9,205
		£606,672	£789,163

Nominal	Trust and Special Funds	Book Value £	Market Value £
£25,000	Treasury 10 1/2% Stock 1999	24,923	24,598
7,510 Shares	Abtrust New European Investment Trust 25p Ordinary Shares	7,428	4,791
3,935 Shares	British Gas 25p Ordinary Shares	8,497	8,834
1,930 Shares	BTR 25p Ordinary Shares	8,393	6,195
128 Warrants	BTR for Ordinary Shares	99	67
1,550 Shares	Cable and Wireless 50p Ordinary Shares	8,493	6,882
3,900 Shares	F & C Eurotrust 25p Ordinary Shares	15,255	12,246
2,520 Shares	Fisons 25p Ordinary Shares	8,496	9,299
5,230 Shares	Fleming American Investment Trust 25p Ordinary Shares	9,269	6,982
3,125 Shares	Fleming Japanese Investment Trust 25p Ordinary Shares	7,734	5,750
1,245 Shares	Guinness 25p Ordinary Shares	8,483	9,474
3,690 Shares	Hanson 25p Ordinary Shares	8,494	6,808
10,020 Units	James Capel Gold and General Unit Trust	7,728	5,010
9,070 Units	James Capel Tiger Index Fund Unit Trust	9,279	6,029
2,905 Shares	Lloyds Bank £1 Ordinary Shares	8,492	8,599
900 Units	M & G Group Charifund	1,956	4,421
3,270 Shares	Sedgwick Group 10p Ordinary Shares	8,493	7,815
	Uninvested cash held by James Capel	9,982	9,982
		161,494	143,782
	National Savings Bank—Investment Account	11,376	11,376
		£172,870	£155,158

Source and Application of Funds Statement for the year ended 31 December 1990

Source of Funds	General Funds		Trust Funds	
	<i>1990</i>	<i>1989</i>	<i>1990</i>	<i>1989</i>
	£	£	£	£
Excess of Income over Expenditure for the year	52,519	24,930	—	—
Other Sources of Income				
Composition fees received	—	150	—	—
Investment sale proceeds	186,405	78,867	168,010	9,301
Legacies	—	100,000	—	—
Net Transfer to Publications Fund	177	—	—	—
Decrease in Shares of Stocks Held	—	2,503	—	—
Increase in Sundry Creditors	977	4,646	—	—
Increase in Contributions received for future years	—	4,374	—	—
	<hr/>	<hr/>	<hr/>	<hr/>
	240,078	215,470	168,010	9,301
	<hr/>	<hr/>	<hr/>	<hr/>
Application of Funds				
Additions to Investments	176,481	157,037	160,974	7,256
Repairs and Improvements Expenditure	22,187	2,873	—	—
Bicentenary Expenditure	—	1,448	—	—
Special Library Expenditure	2,520	5,357	—	—
Increase in Debtors	40,693	19,384	—	—
Net Transfer from Publications Fund	—	1,602	—	—
Transfer for Irene Manton Prize Fund	—	24,996	—	—
Trust Funds Excess of Expenditure over Income	—	—	10,649	9,700
Increase in Contributions received for future years	1,490	—	—	—
	<hr/>	<hr/>	<hr/>	<hr/>
	243,371	212,697	171,623	16,956
	<hr/>	<hr/>	<hr/>	<hr/>
Movement in Cash Deposit and Current Account balances	(3,293)	2,773	(3,613)	(7,655)
Balances at 1st January	24,324	21,551	26,072	33,727
Balances at 31st December	£21,031	£24,324	£22,459	£26,072
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Library

The summer months have been spent, as usual, in trying to bring some kind of logical order to the journal stacks. This year it was the turn of the British journals and these now occupy the sidewall shelving of the Piccadilly side store. They have also been cleaned in the process. The sequence starts with those published by the Royal Society and continues through natural history, biology, botany and zoology, ending in the far end of the corridor outside with a few issues of the *Tea Phytologist*, a humorous journal produced by the Botany School, Cambridge. We only have very incomplete holdings of this (Summer 1913, Spring 1964 and the Sonderheft/Edition Anniversaire of 1977). Any other parts would be welcomed, either originals or photocopies. We did not manage to reshelf the Quarto or oversize volumes: these will be done next and will occupy the far end of the other store. The UK regional natural history journals in the north side upper Gallery have also been vacuumed and dusted. The East Basement oversize journals (Sweden to Antarctica) that were moved to temporary locations last summer to enable new shelving to be installed have also been replaced in the new Compacta store. We are grateful to all the student helpers who, at one stage, had to wear dust masks whilst cleaning some of the older journals.

Thanks to Bruce Ritchie and Ekaterina Dimitrova, we are still up to date with entries in the card catalogue, although there is a considerable backlog of items awaiting cataloguing, including a table-case laden with boxes of books that came to light when we cleared the Annexe for redecoration. Some had been tidied away during Royal visits, other were cleared off the tops of book-cases. They will slowly be absorbed into the general Library. The card catalogue now also includes all the entries for the Insch Tea library, a special collection that featured in *Linnean* 3(1): January 1987. Cards are now being produced for the post-1800 "Opuscula" or reprints held in bound volumes in the Upper Gallery.

Booksale

The next 'bring and buy' booksale will be on 12 March 1992 both before and after the evening meeting on "Genetic fingerprints in birds" for which the speaker will be Dr T. A. Burke. Fellows are asked to bring ANY BOOKS THEY NO LONGER NEED (not necessarily on natural history) any time in the months beforehand. Items selected for the Library will be acknowledged, all others will go to the book sale. We usually have an interesting range of choice: doors open at 16.00 and the sale will resume after the meeting.

Donations

Apart from those listed below, we must thank Mrs Gwyneth Gardener and her son for passing on to us the manuscripts that her late husband, W.A.B. Gardener F.L.S., had suggested depositing in the Linnean Society. These papers relate to projects he was working on over recent years and include card indexes and papers on the uses of the Chinese flora, pesticides of vegetable origin and unpublished manuscripts on tea and rubber. It will take a little time to sort and catalogue these in detail but we hope to describe them more fully in a future issue. Other donations include:

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- Wilson, Charles J., *The Indian presence: archaeology of Sanibel, Captiva and adjacent islands in Pine Island Sound*. 38 pp. illustr. maps, Florida, (privately), 1982.
- Prof. M. F. Claridge Wilson, Michael R & Claridge, M. F., *Handbook for the identification of leafhoppers and planthoppers of rice*. 142 pp. illustr. some col., Wallingford, CAB International, 1991.
- Dr L. N. Derrick Cremlly, R. J., *Agrochemicals, preparation and mode of action*. 396 pp. illustr., Chichester, Wiley, 1991.
- Guiry, Michael D. & Blunden, G., *Seaweed resources in Europe, uses and potential*. 432 pp. illustr., Chichester, Wiley, 1991.
- Dr M. W. Dick Dick, M.W., *Keys to Pythium*. 64 pp. illustr, col. chart, Reading [privately], 1990.
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Book Reviews

Dinosaur Stamps of the World, by Stuart Baldwin & Beverly Halstead. Stuart A. Baldwin & Baldwin Books, 1991, 127 pp. ISBN 0 958063 4 x, £10.00 (+£1.50 p&p).

An old jumble sale copy of the Stanley Gibbon Stamp Catalogue provided me with happy childhood reading on wet Sunday afternoons. Imagination ran wild while poring over wonderfully exotic stamps from places such as Nyasaland, Spanish Guinea and St. Lucia. By contrast British stamps were dull. I never took up stamp collecting but still wonder why certain images appear and how they get there. Native birds and butterflies are popular and obvious subjects, but a donkey pulling a laden cart entitled 'évacuation des ordures', currently appearing on a Niger stamp, requires more explanation!

Dinosaurs lie somewhere in between: they are not obvious but they are popular and they have figured on stamp issues from 44 countries. What is surprising is that we have waited until August of this year for the first appearance of dinosaurs on a British stamp. This debut was due to the enthusiasm and efforts of the late Beverly Halstead (see *The Linnean* 7 (3): ii). The occasion is the 150th anniversary of the word 'Dinosauria' coined by Richard Owen. This little book begins by recounting the events leading to the selection and printing of the British set which featured fine drawing by Brian Kneale. The submissions of other invited artists, including those of Jenny Halstead, are also included as is the reproduction of Jenny's Owen poster for the British Association 1991 meeting.

The substance of the book follows with 96 well-produced plates illustrating all known dinosaur stamp issues and these are annotated with brief and interesting snippets of the dinosaurs (and friends—since some non-dinosaurs have muscled in). The delight of this book is that it hardly needs reviewing because it is up to the reader to conjure up thoughts and questions for themselves. Some of the points which struck me were:—how few images were of dinosaur skeletons; how many countries (e.g. Antigua & Barbuda, Australia, Hungary, Mongolia, St. Vincent) had chosen dinosaur cartoons instead of the real thing; how many images had been culled from existing artwork; and why countries such as San Marino or the Maldives, for instance, had opted for dinosaurs at all. The most far-fetched were the issues of North Korea depicting dinosaurs and spaceships locked in mortal combat, lacking only Raquel Welch.

Dinosaur specialists will have a field day spotting the inaccuracies on the stamps. Philatelists will learn a great deal about the dinosaur images. The book has been written for the two markets and I think that both will gain equally. The book was planned by Stuart Baldwin and Beverly Halstead but Bev's untimely death meant that much of the writing and the finishing touches fell to the first author who generously has dedicated the book to Bev and declared that the royalties will go to the Beverly Halstead Trust Fund.

Finally, might I say that Equatorial (Spanish) Guinea is upholding my fantasies and I thoroughly enjoyed my Sunday afternoon. I encourage you to do the same.

PETER FOREY

Shamrock Botany and History of an Irish Myth, by E. Charles Nelson. Boethius Press. 162 pp. 1991. Hdbk £26, Sfbk £12.50 (or £11.50, if one believes the order form by comparison to the publicity flyer).

Unlike many a modern company logo, the short-lived fashionable designs created by money-hungry corporate advertisers such as the ill-fated bird of the Liberal party, the Shamrock is clearly the old badge of Ireland appearing on everything from souvenir trinkets to tail-fins of the Aer Lingus fleet. However, because its origins lie in the mists of Irish time, which can be induced at any moment by seriously contemplating a bottle of Jamieson's, Shamrock (from seamrog, meaning young clover) turns out not to be one, but at least five species of the pea family. These days, as concluded a century ago by botanists James Britten and Nathaniel Colgan, the yellow clover, *Trifolium dubium* (*T. minus*, or lesser clover), is that most widely considered as the "correct" shamrock but others include *T. repens* (white clover), *Medicago lupulina* (black medick), *T. pratense* (red clover) and even sometimes wood sorrel (*Oxalis acetosella*). In this detailed account Charles Nelson explores the many manifestations of Shamrock in Irish life and attempts to document the major players and their contributions to the myths behind allusions in literature, art, music and botany. Despite attempts to unravel a definitive answer as to what the identity of shamrock might be, like the proverbial Radio 4 programme, he can come to no stronger conclusion that most Irish folk really only mean 'clover' or 'young clover' when they talk of shamrock, nothing more nothing less.

Aphrodite's Mousetrap, a biography of Venus's Flytrap with facsimiles of an original pamphlet and the manuscripts of John Ellis, F.R.S., by E. Charles Nelson, with a 'Tipitiwitchet' postscript by Daniel McKinley. Boethius Press, in association with Bentham-Moxon Trust and the Linnean Society. Pp 145. Hdbk £32. 26 copies bound in full leather and lettered A-Z.

Sensitive plants have always fascinated biologists and this account is certainly about the history of one of my favourites, the Venus flytrap, an amazing species with its ingenious foliar modifications to overcome deficiencies in nitrogen chemistry. The book has a little bit about the biology but is not really about anything much beyond the alpha taxonomy and the curious nomenclature of the 'tipitiwitchet', more about the conditions and botanical excitement that surrounded Venus's flytrap on its first attempts at introduction to Europe from North America. Nelson provides a somewhat fanciful historical account of Venus's flytrap from the first-known reports in 1759 by Arthur Dobbs, Ulsterman, Governor of North Carolina and one of the founders of the Royal Dublin Society, through to the descriptions made by Daniel Solander, who provided the generic epithet, and John Ellis, who provided the specific epithet and saw through a successful description and illustration of the Venus flytrap to the press. The story is one of frustration regarding transportation of plants between the New and Old Worlds in the 18th century. Nelson describes the work of John Bartram who first cultivated the flytrap, pressed it and sent dried specimens to the 'curious of the old world'—plantsmen such as Peter Collison. More importantly he describes the efforts of William Young who eventually successfully transported it alive to Europe. The early introductions, including those of Young quickly died out, but the flytrap was such an interesting species that botanists and horticulturalists continued their efforts. Nelson considers that the work of Ellis was pivotal since it was he that developed techniques to transport plants successfully across oceans. Eventually, the Venus's flytrap was successfully introduced into European gardens helped by Ellis's ideas which are described in the facsimile of his account, "Directions for bringing over seeds and plants from the East-Indies . . ." and his descriptions of *Dionaea muscipula*. Plant buffers old and new will enjoy this book enormously, as they contemplate the difficulties that surrounded the efforts of the pioneers.

C. J. HUMPHRIES

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