
THE LINNEAN

Newsletter and Proceedings of the Linnean Society of London

Edited by B. G. Gardiner

Editorial

This issue of *The Linnean* includes a second article tracing the impact that Sir Richard Owen had on vertebrate palaeontology and comparative anatomy. It was written to celebrate the 150th anniversary of the naming of the Dinosauria which falls this Summer. Later in the year (August 30) the Royal Mail will be issuing a commemorative set of dinosaur stamps.

The concern expressed in our last issue at the low level of funding for taxonomic research at the Natural History Museum has been answered by a standard letter from the Minister for Arts (see Correspondence). Let us hope that the new Minister for Arts David Mellor, Sir John Fairclough and the Director of

the Museum understand the difference between adaptation (last paragraph but one of Minister's letter, p. 7) and extinction! The Museum is now clearly on the list of endangered species—in Owen's terms: it appears to have lost its innate, self-adjusting power.

SOCIETY NEWS

Notes

The Society is once more in the debt of some of its Fellows. From Mr B. E. Smythies, F.L.S. we have received a further £3000 for the Jill Smythies Prize Fund for Botanical Illustration: additionally, Mr Smythies has provided a further £100 to each of the three prizewinners so far. From our Treasurer, Dr R. W. J. Keay, C.B.E. F.L.S., the Dennis Stanfield Prize Fund for tropical African botany has received the first royalties on his book, *Trees of Nigeria*. Mr S. A. Baldwin, F.L.S. has presented us with a portrait replica of Linnaeus taken from an original in the Brentwood Museum and wrongly ascribed to Ray. Mr Baldwin will be giving a lecture entitled 'John Ray (1627–1705): His Life, Work and 17th Century Geology', at the Geological Society on Friday 1 February at 1730 for 1800.

One Fellow of the Society organizes 'executive breaks'—long weekends with leisure activities. One is planned for the South of France to include a number of botanical excursions. The all-in cost is £500. It can be held during April, the last two weeks of May, in June, October or November. Interested members are asked to contact the Executive Secretary.

The Society now offers three postcards to those visiting Burlington House. The painting by Janet Q. Hardman presented to John Fiddian-Green to mark his retirement has made a splendid postcard of the Society's rooms from across Piccadilly: additionally there is a postcard of the portrait of Linnaeus which hangs on the right of the front doors and a picture of Sir J. E. Smith with the boat carrying the Linnaean Collection from Sweden pursued by the Swedish Navy. Each costs 25p.

Contributions — Charges for the Second Journal

The second journal taken by some members is provided at cost. Academic Press have told us that from January 1991 this cost will be £25, taking the contribution of these members to £55. Direct debits will be altered accordingly; members with standing orders will find a proforma at the back of this issue with which to make the change. Other members are asked to note the change when making their payments. Those taking only one journal or none at all are unaffected by this change.

Grants and Prizes

N.E.R.C. Grants: £1000 to Dr I. F. Spellerberg, F.L.S. towards a book *Ecology and Conservation of Amphibians and Reptiles in the Temperate Region of Europe.*

£700 to Hull University Press for the publication of Eva Crackles' *The Flora of the East Riding of Yorkshire.*

Bonhote Bequest: £800 to Dr R. Thorpe, F.L.S. for a study of Heredity and the Cause of Geographic Variation in Quantitative Traits: the Dominican Anole, *Anolis oculatus*.

£1575 to Mr C. J. Hawkes for work on the Investigation of Inheritance of Minisatellite DNA in the Naked Mole-Rat, *Heterocephalus glaber*.

Omer-Cooper Bequest: £350 to Dr G. N. Foster and £200 each to Messrs D. A. Lott, R. Carr and M. D. Eyre to attend the Balfour-Browne Club meeting in Leon, Spain on European water beetles.

Appleyard Fund: £500 to Dr E. A. Flint, F.L.S. for the Flora of New Zealand Desmids.

£2962 to Mr B. J. Ford, F.L.S. to study the Role of the Simple Microscope in Microscopical Research.

£161 to the late Mr W. Gardener, F.L.S. for studies on the Origin and Distribution of Eight Medicinal Plants.

£374 to Dr P. Knight-Jones, F.L.S. for Studies on Sabellid Tubeworms in Paris Museum.

£1000 to Dr N. K. B. Robson, F.L.S. for studies in the Genus *Hypericum* L. (Gutiferae).

Dennis Stanfield Prizes: Awards of £500 each have been made to Miss B. N. Khayota (East African Herbarium, Kenya) for work on Orchids of Kenya; to Dr I. A. Okwujiake (University of Calabar, Nigeria) for work on the Cultivation of *Pleurotus tuber-regium*, an Edible Tropical Mushroom: to Mr B. Ziraba (Makere University, Uganda) for Studies in the Taxonomy of the Genus *Solanum* (Solanacaea) in Uganda.

Members are reminded that the deadline for applications for the Society's grants and prizes is 31 March 1991, except for the Irene Manton and Jill Smythies Prizes, for which the deadline is the end of September 1991.

From the Archives

Extract from George Bentham's letter, dated December 25, 1836 and written from Vienna, where he and his wife were spending Christmas.

"Last night we went to see the Endlichers' nephews and nieces, at their Christmas Eve fête. On this grand occasion for all German children, a large branch of fir is decked out with wax tapers and hung round with ribbands, cakes and sugarplums; it is called the Christbaum and on tables round, are arranged a variety of presents, which are made to them by their parents and friends, through the medium of the Christkind. The children are all kept in a rather dark or sometimes quite dark room, till their father rings a bell. The doors are thrown open and the brilliantly lighted up Christmas tree, with all the presents around, are suddenly shown to them and this moment of delight is never forgotten and spoken of with rapture, even by grown up persons, who recollect it as the happiest moment of each year of childhood... I longed to see this as it is the groundwork of many German tales".

Wellclose Square
17 June, 1834

To D. Don Esq.

My dear Sir,

During the last five years I have been engaged in a series of experiments upon the growth of Plants in closely glazed vessels, a short account of which I had the honour of laying before the Linnean Society in 1833. I should not again have troubled the Society upon the subject had not these experiments been followed by results as curious as I believe them to be practically important. The first object which I had in view was to ascertain the practicability of growing certain Plants in Town which had hitherto resisted all attempts at culture in the smoke of London. For this purpose I selected among others, the *Hymenophyllum thunbridgense* and found that this and most other plants would grow for years without requiring any fresh supplies of water. I likewise ascertained that plants thus protected would bear much greater degrees of heat and of cold than they could when exposed to free contact with the air; for example the *Hymenophyllum* bore, uninjured, constant exposure to the Sun, while the *Aspidium molle* is now flourishing outside one of my windows with a northern aspect, where it has been for the last two years. In this point of view the analogy of the vegetable with the animal frame is very great, as according to the well-known observations of C. Blagden, Capt. Parry and others, Man can bear very extremes of temperature, provided the surrounding atmosphere is perfectly still and unruffled. Acting then upon these facts, I directed my attention to the conveyance of Plants upon long voyages, and for this purpose sent two cases to New Zealand under the care of a zealous friend Capt. Mallard, whose reports I have such pleasure in presenting to this Society. Upon these reports I need not say one word by way of comment and shall therefore conclude with the expression of my thanks to the Mess. Loddiges, whose ample... have always been shown to me in the most liberal and inspiring manner.

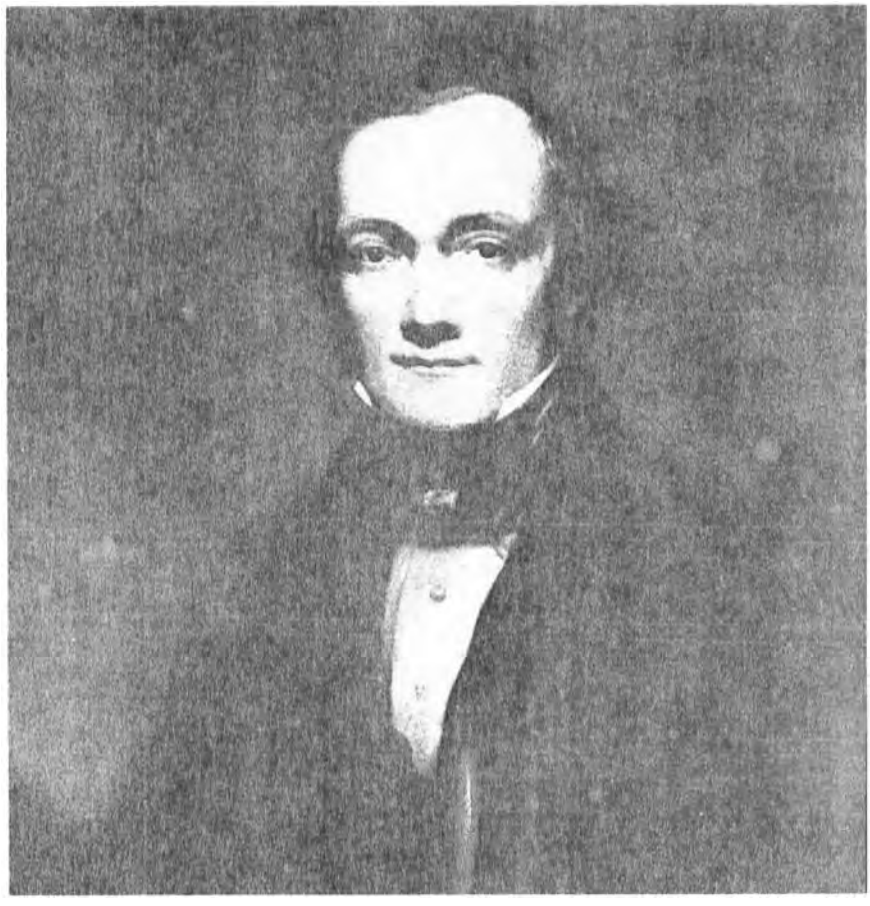
I am My dear Sir
Yours very truly
N. B. WARD

Picture Quiz

Lorenz Oken (1779–1851) was the subject of our August quiz (*6*(3) : 8). Born to poor farmers in the Black Forest, Oken studies at the Universities of Freiburg, Würzburg and Göttingen. At the age of 24 he published a system of Naturphilosophie which he further elaborated in 1805 in a book entitled *Die Zeugung*. Earlier in 1759 Casper Friedrich Wolff, in his doctoral dissertation *Theoria Generations* had shown the falsity of the theory of preformation by his observations on the growth of the germinal disc in the chick. However, such authorities as Haller (who figured in our previous quiz *6*(3) : 7) so dogmatically asserted that all parts of the animal body were created together that Wolff's work was long forgotten before the facts were discovered afresh by Oken in Jena in 1806. Oken's contribution to the organogenesis of the intestinal tract clearly

re-established Wolff's epigenesis theory. The following year (1807) Oken independently originated and published on the vertebral composition of the skull (*Über die Bedeutung der Schädel knochen*). Goethe also conceived the idea that the skull consisted of a number of modified vertebrae (see *The Linnean 6*(2) : 5) but did not publish on it until 1820*. Oken, however, in claiming priority for the theory became involved in a long and bitter polemic with Goethe. Oken made important contributions to comparative anatomy and his works were often cited by Cuvier. In 1817 he founded his own Journal *Isis oder enzyklopädische Zeitung von Oken* for which he wrote the majority of articles between 1817–1847. Eventually, at the age of 53, he secured a post at the new University of Zurich (1832) where he remained until his death.

Today Oken is regarded as the father of scientific meetings for his role in the creation of scientific congresses as long ago as 1822!



Who? (clue: like Goethe and Oken he believed the skull to be segmented). Solution by March to the Editor. Prizes include old prints, reprints, pamphlets etc.

There were two correct answers to the August portrait of Oken from Stephen J. Gould and Edward I. Saiff.

*After he heard of the ideas of E. Geoffroy St Hilaire (1796).

Meetings and Calendar

17 January	Evening meeting: *North Sea Task Force.* Dr P. C. Reid.
14 February	Day meeting with the British Ecological Society: *Benthic Communities and Environmental Change**.
28 February –1 March	Two-day meeting: *Grasses of Arid and Semi-Arid Regions**.
1 March	Deadline for nominations to Council and Office (Bye-Law 10.2).
21 March	Evening meeting: *Multiple Polymorphisms in Butterflies, Moths and Bivalves.* Professor Denis Owen
2–5 April	Four-day meeting with the Royal Botanic Gardens at Kew: *Labiatae**.
9 May	Day meeting with the Society of Botanical Artists: *Botanical Art and Botanical Illustration*†.
16 May	Day meeting to mark the 80th Birthday of Professor William Stearn†.
24 May (Friday)	Anniversary Meeting.

*Flier with August *Linnean*.
†Flier with this issue.

Society General Meetings at which members will be admitted will be held on 17 January at 5 pm, on 1 March at 1.45 pm and on 9 May at 1.45 pm.

Certificates of Recommendation of Foreign Members will be read on 17 January and 1 March (Bye-Law 4.3).

Elections of new members will take place on 17 January and at the Anniversary Meeting.

Election of two members of the Audit Committee will take place on 17 January (Bye-Law 13.6).

Sixth Form Meetings. Members can attend these by arrangement with the Executive Secretary. On 10 January, there is a day symposium on *Control of Pests and Weeds*, and there are evening lectures on *Ecology of Snowdonia: Effect of Acid Rain* (21 January), *Genetics* (25 February) and *Photosynthesis* (18 March).

Linnean Society International Symposium on *Evolutionary Patterns and processes**. This symposium will be the 2nd Regional Meeting of the Society, to be held in Cardiff from 24 to 26 September 1991. The meeting will attempt to bridge the gap between the study of living organisms and fossils. The discussions will centre around three major themes — 'Species and speciation', 'Gradualism versus punctuated equilibrium — 20 years on' and 'Determinism versus chance'. Speakers who have presently agreed to participate are Guy Bush (Michigan), Richard Forty (Natural History Museum), Stephen J. Gould (Harvard), Godfrey Hewitt (Norwich), Hugh Paterson (Brisbane), Michael Ryan (Texas), Peter Skelton (Open University) and Clive Stace (Leicester).

The proceedings of the meeting will be published by Academic Press in the Linnean Society Symposium series. The organizers will be Professor Michael F. Claridge and Dr Diane Edwards, University of Wales, Cardiff, from whom further particulars will be available.

*See advert p. 42.

Correspondence

Dear Brian,

Not having any other practical way to address the Fellowship could I please use your column?

I write to thank everyone, Fellows and others, who so kindly subscribed to the magnificient watercolour of Burlington House presented to me at the Anniversary Meeting. You will know that I was able to thank those of you present at the time but I was unable, of course, to address those who were not.

I was deeply touched by both the President's remarks and by your collective generosity, and the picture will be a constant reminder of my time at 'The Lin' and of the many good friends I was able to make whilst working for you.

I believe, from words exchanged after the meeting, that you all may be able to share my gift as I understand it is to be reproduced for a greetings card. Naturally I will be delighted if this does occur as, knowing the way these things go, I am certain that most of you will not have seen to what you were in fact subscribing.

Again, very many thanks, and best wishes.

Very sincerely,
JOHN FIDDIAN-GREEN

Minister for the Arts,
Horse Guards Road,
London SW1P 3AL

26.6.90

Dear Professor Claridge,

Thank you for your letter of 7 June about the Natural History Museum. I am aware that you have written on behalf of the Linnean Society to several Ministers in similar terms; I am replying on behalf of the Government. You can be assured that my office, in conjunction with the museum, is considering carefully the points raised in the correspondence I am receiving on the subject.

I attach the very highest importance to the work of the Natural History Museum and its future plans. This is highlighted by my announcement last November of a 16.5% increase in the Museum's grant-in-aid to a new 1990/91 figure of £25.2 million including an 11.4% increase for running costs. Over the past ten years Government funding of the Museum has risen by 12.8%, (including funding for the Geological Museum which the Natural History Museum took over in 1985). I enclose a table which gives details of the Museum's funding.

All the national museums and galleries for which I have responsibility, including the Natural History Museum, prepare corporate plans setting out their long-term aims and objectives. I understand that the key objectives of the reorganization proposed in the Museum's 1990 Corporate Plan are: to

strengthen curation; to focus research effort more sharply into areas of particular importance; to improve the management of the collections; to develop exhibition facilities and other services for all who use the Museum. These aims are fully in line with the Museum's statutory duties as custodian of the nation's natural history collection.

The Natural History Museum is justly proud of its long record of scholarship and of the focus it provides for taxonomic research. Taxonomy will continue to pervade all the Museum's scientific work. There will be no diminution in the care and maintenance of the collections, and a more efficient advisory service will be built up for visiting scientists and the public. The Museum aims to concentrate research effort primarily into a range of scientific programmes of direct relevance to such issues as Environmental Quality, Living Resources, Mineralogy and Human Health.

The announcement of these plans has generated a widespread debate about the relative priorities which should be accorded to particular areas of research at the Museum. I know that the Museum is in close touch with members of the scientific community, and discussed its overall strategy with leading scientists at an open meeting on 15 June. The Museum is also in discussion with the Government's Chief Scientific Adviser, Sir John Fairclough. I have asked the Adviser to keep me informed of the Museum's position in relation to the U.K. science base. I shall also be meeting the Chairman and Director of the Museum to discuss the Corporate Plan and the wider issues. My overall priority, which I know the Museum shares, is to ensure that the highest standards of excellence in research are allied to maximum public access and enjoyment of the unique collections held on behalf of the nation.

In order to achieve the aims which the Museum has clearly identified and published it has to adapt, and therefore proposes to introduce changes to its structure. I understand the Museum intends to make more appointments on a fixed-term basis to allow more flexibility to meet changing demands. This will mean a reduction in permanent posts, to be achieved where possible by natural wastage and redeployment within the Museum. It has been the Government's long-standing principle to devolve authority in such matters to individual museums. It therefore considers the detailed management changes proposed at the Natural History Museum to be the direct responsibility of the Museum's Director and Trustees.

I am forwarding a copy of your letter to Dr Neil Chalmers, Director of the Museum, so that he may be aware of your concerns.

RICHARD LUCE

Appeal for Information

Eric Freeman is writing an article on the founders of the Geologists' Association, and would be very pleased to learn of portraits, photographic or otherwise, of Edward CRESBY (1824–1870), John Ebenezer WAKEFIELD (1819–1903), Charles WOODWARD (*c.* 1789–1877) and, in particular, Samuel Joseph MACKIE (*c.* 1820–1902). If you can help, please write to Eric Freeman, 146 Haydons Road, Wimbledon, London SW19 1AE. Assistance will of course be acknowledged.

Clift, Darwin, Owen and the Dinosauria... (2)

Although Richard Owen worked alone on all British and most foreign fossil specimens, he often discussed his conclusions with Charles Darwin. This custom started in 1837 when Owen sent Darwin his proof sheets on *Toxodon* for criticism. By that time Darwin and Owen had become good friends and Darwin often called in at the Owen's for tea in the afternoons.

In April 1837 Owen began preparing his Hunterian lectures (which he was to give every year until 1855); he gave several of the early lectures to Darwin to read prior to delivery, including the second lecture read on May 4 1837 (originals in the Natural History Museum). This particular lecture dealt with comparative anatomy and the natural affinities of animals one to another and stressed the system of analogies established by Aristotle. In subsequent lectures (also probably read by Darwin) he repudiated Haller's concept of preformation (see *The Linnean, 6*(3) : 7), emphasizing that structural modification was environmentally correlated. Owen and Darwin also corresponded with one another on a regular basis on all manner of subjects ranging from the production of monsters to weathered elephant's tusks from Peru and coral reefs. Furthermore, Darwin is recorded as attending several communications read by Owen, including his paper on *The Anatomy of the Southern Apteryx* (April 10 1838, *Zoological Society*) in which he (Owen) noted "there is no greater anomaly in nature than a bird that cannot fly," and his *Report on the Archetype and Homologies of the Vertebrate Skeleton*, presented to the British Association Meeting at Southampton in the summer of 1846 (Darwin was a Vice President of Section D — Zoology and Botany — that year). The latter report, which elaborated on his earlier *Essay on Archetypes* (see letter from Darwin to Owen on this subject, 1843), was also the working draft for his new Hunterian Osteological catalogue. While Owen was preparing this work for final publication in January 1847 (published 1848 by John Van Voorst, London at 10/-), Darwin was a frequent visitor to the Owen household, often appearing before breakfast. During their deliberations Owen explained at length the concept of homologies, both special and general, as applied to the vertebrate skull (his broad sheet of Osteology, referred to in Caroline Owen's diary). He also pointed out that the progressive specializations which he envisaged as having taken place from the generalized archetype were implicit in the epigenetic theory established by Oken and elaborated by Baer — and that in his view embryology illuminated morphology. Owen's explanation for these progressive specializations was that the modifications undergone by the various classes of vertebrates were directly correlated with the mode of life to which they are adapted. He believed that each organism had its innate tendency to develop in a particular symmetrical manner with its own internal and special laws of growth governed by external conditions: "This accounts for its specific identity and divergence from other organisms".

At the same British Association meeting at Southampton, Darwin also dutifully attended Owen's miscellaneous communication to the Geology Section: *Notices of some Fossil Mammalia of South America*, in which Owen described a new species of *Toxodon*, an entire *Mastodon* skeleton and the new genus *Nesodon* discovered by Captain Sullivan in Patagonia. Darwin and Owen had examined most of these bones together earlier in the year at the College of Surgeons (see

letter from Darwin telling Owen of the arrival in London of Sullivan with six casks of fossil bones from southern Patagonia).

Both Owen and Darwin attended the following British Association meeting, held at Oxford in the summer of 1847. Once again Darwin listened to Owen read a miscellaneous communication to the Geology Section, this time *On the Fossils obtained by the Marchioness of Hastings from the Freshwater Eocene Beds of the Hordle Cliffs*, when he compared the fossil crocodiles from Hordle with those from

Figure 1. Hawkins Invitation to Dinner.

Sheppey and with the extant forms from the Indian continent. The following day Darwin and the Owens together with Langberg from Norway went for a trip on the Thames in a hired boat. Meanwhile, in 1844 Robert Chambers published anonymously his *Vestiges of the Natural History of Creation*. He sent a

copy to Owen who wrote lengthily in acknowledgement, pointing out some errors and referring to his own interest in investigating the possibility of the development of the Hottentot from the chimpanzee, but concluding "many particulars in the anatomy of both black and red orangs are decisive against any such hypothesis in the present state of physiological knowledge". In 1849 Owen's volume, *On the Nature of Limbs* was published and he duly forwarded a copy to Chambers who replied "I am rather poorly off, for like my brother Wiliam, and

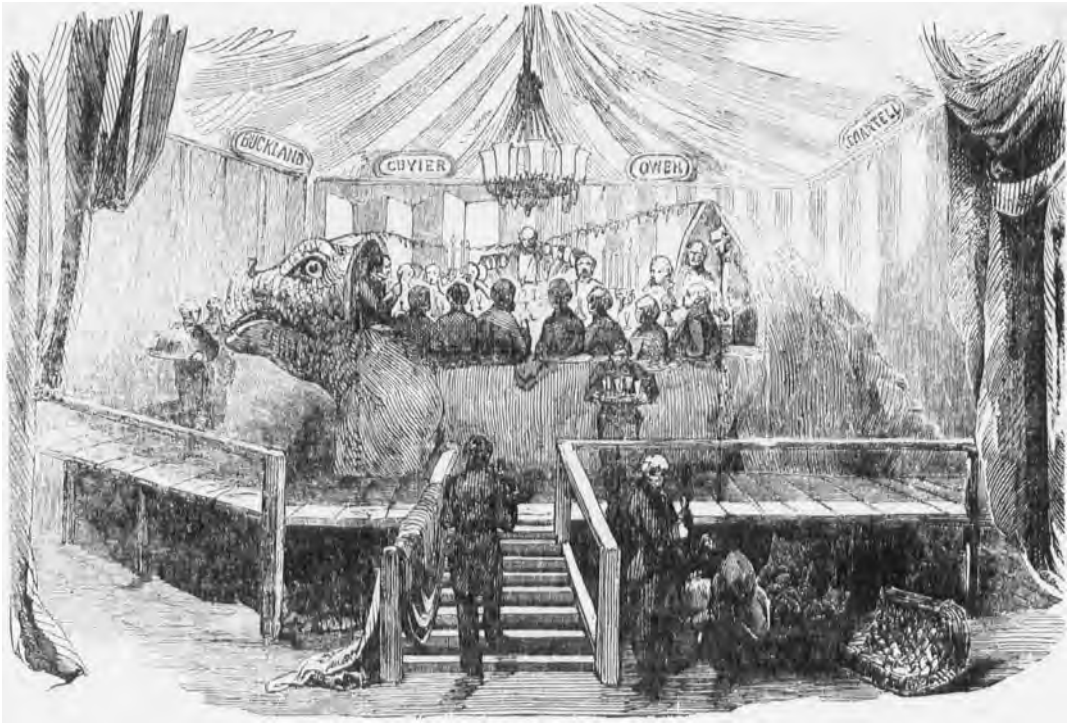
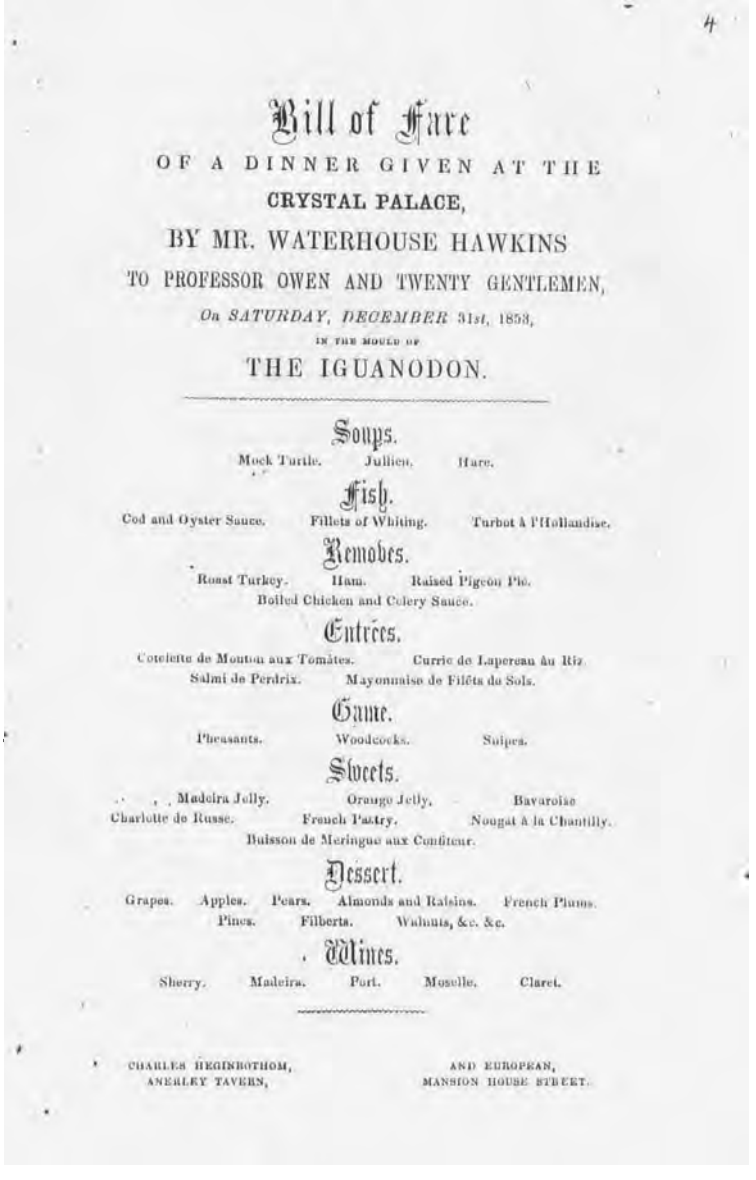


Figure 2. New Year's Eve party in the belly of the *Iguanodon*.

another brother and sister, I have six toes and six fingers, and two of my own children have similar superfluities; so that it is a joke amongst us, that we are manifesting a tendency to return to the reptilian style". In this publication *On the Nature of Limbs: A discource delivered on Friday February 9, at an evening meeting of the Royal Institution of Great Britain* (1849, John Van Voorst, London), Owen endeavoured to demonstrate the orderly succession and progression of land vertebrates "from the first embodiment of the vertebrate idea under its old piscine vestment until it became arranged in the glorious garb of the human form". In doing so he showed how the arms and legs of humans are related to the rudder fins, legs and wings of other vertebrates and, in passing, demonstrated how the splint bones of the foot of a horse are analogous to those of the fingers of our hands.

In the following year, 1850, he read a paper to the Zoological Society on *Dinornis (Part IV): containing the restoration of the feet of that genus and of Palapteryx, with a description of the sternum in Palapteryx and Aptornis (Transactions of the Zoological Society, 4*: 1–20). In this paper he introduced for the first time the fable of the

Oak and the Reed: noting that "the smaller and feebler animals have bent and accommodated themselves to changes which have destroyed the larger species — they have fared better in the battle of life". Owen was trying to explain why "just the smaller sloths and armadillos still linger in South America, the smaller kangaroos, wombats, dasyures and marsupials in Australia and a few species of the comparatively diminutive wingless birds of the genera *Apteryx* and *Brachypteryx* still exist in the island where their peculiar families were once much



Bill of Fare

OF A DINNER GIVEN AT THE

CRYSTAL PALACE,

BY MR. WATERHOUSE HAWKINS

TO PROFESSOR OWEN AND TWENTY GENTLEMEN,

On SATURDAY, DECEMBER 31st, 1853,

IN THE MOULD OF

THE IGUANODON.

Soups.

Mock Turtle. Julien. Hare.

Fish.

Cod and Oyster Sauce. Fillets of Whiting. Turbot à l'Hollandise.

Removes.

Roast Turkey. Ham. Raised Pigeon Pie.

Boiled Chicken and Celery Sauce.

Entrées.

Cotelette de Mouton aux Tomates. Curric de Lapereau au Riz.

Salmi de Perdrix. Mayonnaise de Filets de Sols.

Game.

Pheasants. Woodcocks. Snipes.

Sweets.

Madeira Jelly. Orange Jelly. Bavaroise

Charlotte de Russe. French Pastry. Nougat à la Chantilly.

Buisson de Meringue aux Confiteur.

Dessert.

Grapes. Apples. Pears. Almonds and Raisins. French Plums.

Pines. Filberts. Walnuts, &c. &c.

Wines.

Sherry. Madeira. Port. Moselle. Claret.

CHARLES HEGINBOTHOM, ANERLEY TAVERN, AND EUROPEAN, MANSION HOUSE STREET.

Figure 3. Menu for New Year's Eve party.

more richly represented by species on a larger scale". Owen thus obviously believed in the operation of external influences and the contest of existence which leads to some species such as *Dinornis* becoming extinct. He no doubt

discussed such matters with Darwin in their several deliberations on the archtype. However, Owen considered extinction to be "a direct consequence of the want of self-adjusting power in the individuals of the species subject thereto".

Later that year (1850) Owen became involved in the organization of *The Great Exhibition*. He was appointed Chairman of Jury IV: "On Animal and Vegetable Substances chiefly used in Manufacture as Implements or for Ornaments" and a member of Jury V: 'The Animal Kingdom' (Chairman Lord Stanley). Coincidentally this second commitee had submitted to it several sculptures by Benjamin Waterhouse Hawkins, including a group in bronze of European Bison or aurochs and a model of the anatomy of the horse. The committee decided that they were "hardly aware whether models of Animals and of Animal Sculpture fell under the subjects referred to them, but thought it their duty to suggest such

Figure 4. The Crystal Palace *Megalosaurus*.

objects should be introduced". Hawkins' address first appears in Owen's notebook for 1834–36 and Owen employed him on several occasions as an artist to lithograph plates of papers in the *Zoological Society Transactions*.

After the exhibition closed in 1852 the Crystal Palace (a temporary building of glass and cast iron) was purchased and removed (at a cost of £95 000) from Hyde Park and re-erected (at a cost of £135 000) on a hill top in the midst of a rural estate (Penge Place, purchase price £50 240) of some 200 acres of landscaped grounds by the Crystal Palace Company. As part of the Victorian love of education it was decided to turn over part of the park to geology and to create cliffs of Limestone, Millstone Grit, New Red Sandstone, etc. and to site

amongst the trees and bushes life-sized models of prehistoric animals and plants. The idea of exhibiting restorations of certain extinct animals (as in life) originated with Owen who communicated the suggestion to Sir Joseph Paxton (the architect and creator of the Palace and its grounds) in 1852 (see Owen's note books). Paxton, on Owen's suggestion, employed Waterhouse Hawkins as the Director of the fossil department of the Crystal Palace "to provide examples of everything that can illustrate the science of palaeontologists". A great tidal lake was excavated with two islands on which were originally sited 26 extinct

Figure 5. The Crystal Palace *Iguanodon*.

animals. The life-sized models included examples of dicynodonts, *Labrinthodon, Ichthyosaurus, Teleosaurus, Plesiosaurus, Mososaurus*, pterodactyls and the three dinosaurs—*Megalosaurus, Iguanodon and Hylaeosaurus. Megatherium, Anoplotherium* and the Irish elks were added at a much later date. Paxton proposed that Owen should receive an architect's percentage on the cost of "The Geological Past" of the Crystal Palace Garden. Owen declined, but the Directors presented him with a free pass or Life Admission to the Palace and Grounds in acknowledgement of his services. Thus the first life-sized sculptures of dinosaurs came into being under the watchful eye of Richard Owen, who provided Hawkins with the necessary anatomical advice, who in turn submitted his designs to Owen for criticism. Hawkins then built a series of minature models in clay (plaster replicas now in the Natural History Museum) and after their accuracy had been checked by Owen, a copy in clay of the natural size was made (some weighing more than 30 tons), from which a mould was prepared and a cast was taken from the mould. Details of the materials employed in the construction of the 35′ long *Iguanodon* are as follows: "four iron columns 9 feet long, 7 inches in diameter; 600

bricks, 650 five-inch half round draintiles, 900 plain tiles, 38 casks of cement, 90 casks of broken stone (making a total of 640 bushels of artificial stone). These with 100 feet of iron hooping and 20 feet of cubic-inch iron ore constitute the bones, sinews and muscles of this large animal, the largest of which there is any record of a casting being made". The recorded cost to the Crystal Palace Company for the natural history illustrations is £11 176.

On New Year's Eve 1853, Hawkins arranged a grand banquet for 21 guests to celebrate the imminent completion of his commission. This was held in his studio at the Crystal Palace inside the body of his largest model (described above), the partially completed *Iguanodon*. Eleven guests sat in the mould itself and a further ten on an accessory table at right angles to the beast (Fig. 2); all were sheltered by an awning of pink and white drapery around the ceiling of which hung a number of pennants with such names as Cuvier, Mantel and Buckland. Guest of honour was of course Richard Owen, who was seated inside the head and flanked on his right by Professor Edward Forbes, Hawkins, Gould (the ornithologist), Prestwick (a geologist) and the Directors of the Crystal Palace Company. After a sumptuous dinner (Fig. 3) Owen, in proposing the health of their host, explained how Cuvier, that great comparative anatomist, had taught us how to build up and reconstruct various extinct animals from the merest fragments, and congratulated Mr Hawkins on the accuracy of his reconstructions while Forbes toasted the success of "The Geological Past". The success of "The Geological Past" can be judged by the number of spectators who flocked to the Palace and its grounds during its first decade of opening. However, subsequent research has shown that the *Iguanodon* in which they sat did not have a rhinoceros-type horn on its nose (as given it by Clift—see *The Linnean*, *6*(3) : 21) and perhaps its hind legs should have been somewhat longer and its girth a little smaller.

The Crystal Palace was opened by Queen Victoria on 10 June 1854. Amongst the 40 000 spectators and guests were Richard Owen in the company of the Prince Consort, the French Emperor and the King of Portugal. Charles Darwin (Owen's guest) also attended with Emma and some of the children. Eventually Mr Laing introduced Professor Owen and Mr Waterhouse Hawkins to the Queen noting that as a result of their efforts "the gigantic *Iguanodon*, the *Icthyosaurus* and other monsters of the antediluvian world, will now present themselves to the eye as they once disposed themselves and pursued their prey amid the forests and morasses of the Secondary and Tertiary periods".

Ironically most visitors to the Park at that time, like Laing, not only considered these dinosaurs and other pre-adamitic animals to be antediluvian monsters but also regarded the whole "Geological Past" to be "a mausoleum of the memory of a ruined world" (*Quarterly Review*, 1854). After the publication of *The Origin of Species* five years later, this view, hopefully, changed!

Today the freshly painted dinosaurs still present a free and unusual sight for visitors to Bromley's largest and most historic public park.

[To be continued.]

Source Material includes: Minutes of the Great Exhibition; Minutes and Accounts of the Crystal Palace Company; Owen's Library, papers and note books.

My thanks to Mandy Holloway for the photographs of the monsters.

B.G.G.

Record of the Proceedings of the Linnean Society of London for the 202nd Session (1989–90)

The Anniversary Meeting

This was held on 24 May 1990 with Professor M. F. C. Claridge, President, in the Chair.

Officers, Council and Committees 1990–91

PRESIDENT	Professor M. F. Claridge
PRESIDENT ELECT	Professor J. G. Hawkes
VICE-PRESIDENTS	Dr D. Edwards
	Professor J. Green
	Professor J. G. Hawkes
	Dr K. A. Joysey
TREASURER	Dr R. W. J. Keay (1989)
SECRETARIES	
Botanical	Dr C. J. Humphries (1990)
Zoological	Professor J. Green (1988)
Editorial	Professor J. D. Pye (1985)

COUNCIL The President, President Elect, Treasurer, Secretaries and:

○ Miss C. E. Appleby	− Mrs P. D. Fry
+ Professor J. A. Beardmore	+ Dr D. Galloway
+ Dr P. E. Brandham	− Dr P. A. Henderson
− Mr F. H. Brightman	○ Dr G. McG. Reid
− Dr D. F. Cutler	○ Dr P. R. Richards
+ Dr D. Edwards	− Mr M. J. S. Sands
○ Dr Y. Z. Erzinclioglu	+ Dr V. R. Southgate

− Due to retire 24 May 91
+ Due to retire 28 May 92
○ Due to retire 24 May 93

Currently there is a vacancy for an 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	Dr D. R. Lees (1990)
Botanical Journal	Dr S. L. Jury (1985)
Zoological Journal	Dr D. B. Norman (1989)
Synopses Series	Dr D. M. Kermack (1980)
The Linnean	Prof B. G. Gardiner (1980)
Reviews	Prof J. G. Vaughan (1990)

Specialist Group Secretaries

Biogeography	Mr I. B. K. Richardson (1983)
Bryology – correspondence	Mr J. H. Field (1983)
Computer Applications	Dr F. A. Bisby (1984)
Freshwater	Dr K. T. O'Grady (1986)
Meiofauna	Dr H. M. Platt (1987)
Palaeobotany	Dr B. A. Thomas (1981)
Palynology	Mrs M. Harley (1990)
Plant Anatomy	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.)
Mr J. F. M. Cannon (1977)
Prof B. W. Fox (1989)
Mr C. M. Hutt (1989)
Dr V. R. Southgate (1988)
The Editors (e.o.)
Treasurer (e.o.)
Botanical Secretary (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; 1980)
} by invitation

†*PROGRAMMES COMMITTEE*
The Zoological Secretary (e.o.)
The Botanical Secretary (e.o.)
Dr J. H. Crothers (1984)
Dr F. H. Perring (1987)
Mrs V. M. Purchon (1986)
Dr P. M. Rainbow (1987)
Dr D. Rollinson (1988)
Dr D. A. S. Smith (1988)
Dr S. M. Tilling (1988)
Specialist Group Organisers by invitation
Dr S. Blackmore (Syst. Assoc.)

FLORA EUROPAEA TRUST
The Botanical Secretary (e.o.)

†*FINANCE*
The Treasurer (e.o.)

Mr A. O. Chater (1977)
Dr J. R. Edmondson (1990)
Dr S. M. Walters (1977)
The President (e.o.)
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)
Prof J. G. Hawkes (1982)

†*MEDALS AND AWARDS*
The President (e.o.)
The Vice Presidents (e.o.)
Botanical, Zoological } Members of Council present 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)

CONVERSAZIONE
Mr F. H. Brightman (1990)
Prof B. G. Gardiner (1990)
Prof J. G. Hawkes (1990)

REPRESENTATIVES ON OTHER BODIES

Biological Council	Dr R. I. C. Spearman (1976)
British Ecological Society	Mr F. H. Brightman (1988)
British National Committee for Biology	Scientific Secretaries
British National Committee for Oceanic Research	Dr P. G. Moore (1984)
Coordinating Commission on Biological Recording	Dr M. R. D. Seaward (1990)
Exeter University Court	Mr I. J. Linn (1975)
Field Studies Council	Dr D. H. Dalby (1981)
Field Studies Council AIDGAP	Prof D. L. Hawksworth (1980) Mr P. J. Wanstall (1980)
National Trust	Prof R. J. G. Savage (1989)
Percy Sladen Memorial Fund	Prof R. J. Berry (1985)
Systematics Association	Prof J. Green (1988)

†The Officers are *ex officio* (e.o.) members.
*Not Members of the Society.

Presentation of Medals and Awards

The President read the citations and presented the Linnean Medals, the Bicentenary Medal, the H. H. Bloomer, the Jill Smythies and Irene Manton Awards.

Linnean Medal for Zoology
Professor Gwendolen Rees

Gwen Rees as she prefers to be known was employed by the University College of Wales, Aberystwyth for over 44 years during the whole of which time

she pursued her chosen career as university teacher, research worker and administrator with unstinted dedication. Her contribution to parasitology can be judged by the world-wide reputation that Aberystwyth enjoys today as a major centre in helminthology, and by the fact that she was the first woman academic in Wales to be elected a Fellow of the Royal Society.

Gwendolen Rees received her formal education at the Intermediate School for Girls, Aberdare (1918–1924) from which she won scholarships to University College, Cardiff to read chemistry, botany and zoology. She graduated in zoology in 1928 and subsequently studied for a Ph.D. in helminthology which she completed 18 months later having examined over 5000 snails on 100 separate days from 86 different localities! At Cardiff she was undoubtedly influenced by her head of Dpartment, Professor W. M. Tattersall who, like her, was a prodigious worker with an unassuming modesty and a hatred of self-advertisement. She was also perhaps lucky to have had the famous helminthologist R. T. Leiper as her external examiner, for he not only clearly recognized her potential but also took the trouble of recommending her in 1930 for the post of Assistant Lecturer in Professor R. D. Laurie's Zoology Department at Aberystwyth. Here she remained all her working life, becoming Lecturer in 1937, Senior Lecturer in 1946, Reader in 1966 and the holder of a Personal Chair in 1971 — the same year that she was elected a Fellow of the Royal Society.

Gwen has published some 70 original papers in primary journals related to two main topics: (i) the nature and significance of the digenean life cycle with particular reference to the intra-molluscan stages; (ii) the morphological and ecological explanations of host specificity — as seen from detailed studies of tapeworms.

Some of her most elegant and informative research came in the late sixties and early seventies with the advent of the electron microscope which she used to great advantage in her investigations of the movement and behaviour of cercariae, and the ultrastructure of tapeworms.

She is a friendly, courteous and scholarly lady devoted to her subject, her former students and to her College. Consequently, generations of students as well as helminthologists the world over will be delighted that the Linnean Society has honoured Gwendolen Rees by awarding her the Linnean Medal for Zoology for 1990.

Linnean Medal for Botany
Professor Ghillean Tolmie Prance

Ghillean Prance's distinguished research career on the plants of the Amazon forests of Brazil is well known to botanists, particularly in Britain and the Americas. Of equal importance, perhaps, is his commitment to the cause of tropical forest conservation and his very wide range of botanical interests. His contributions to tropical forest ecology are indeed widely recognized.

From Malvern College Ghillean Prance went on to Keble College, Oxford, completing his B.A. in Botany in 1960, and his D.Phil in 1963, the subject of his thesis being 'A Taxonomic Study of the Chrysobalanaceae'. From 1963 to 1968 he was first a Research Assistant and later an Associate Curator at the New York Botanical Garden. This was followed by his appointment as the B.A. Krukoff Curator of Amazonian Botany (1968–75), Director of Botanical Research

(1975–81) and, later, Director of the Institute of Economic Botany (1981–88), all these posts being held at the New York Botanic Garden. In 1988 he accepted the Directorship of the Royal Botanic Gardens, Kew, and was awarded an Honorary Professorship from Reading University in 1988. He was elected a Fellow of the Linnean Society in 1961.

These bare facts do less than justice to Ghillean Prance's career. Thus, during his period in New York he took up, at various times, Visiting Professorships in Denmark, Colombia, Brazil, China, U.K. (Reading) and two North American Universities. His research has continued to be mainly on Amazonian plants, for which work in the field has naturally been of considerable importance. Thus, apart from one field trip to Turkey, he has participated in and mostly led expeditions to Surinam, Colombia, Venezuela, French Guiana and at least 15 expeditions to the tropical rain forests of Brazil, each lasting several months. Only someone capable of intense concentration and really hard work could have fitted all these activities into his life.

In addition to his administration, teaching and field work Ghillean Prance has published 140 scientific papers, 51 general articles and nine books and monographs. Invited lectures to learned societies number 43, whilst edited books total seven.

Looking more closely at Ghillean Prance's list of publications one is struck very forcibly by his breadth of vision, since his works range through taxonomy, speciation, ecology, phytogeography, ethnobotany, ethnomycology, taximetrics, reproductive biology and conservation studies.

This seems to be a sum-total of work that might have covered several lifetimes but in fact Ghillean Prance has several decades of his active career in front of him for further expeditions, research and writing. We welcome him back to this country and look forward to hearing of his continuing success.

Ghillean Prance has received many medals and awards internationally. In recognition of his distinguished achievements in botanical science the Linnean Society is delighted to add another one, and to award him the very well-deserved Medal for Botany in 1990.

H. H. Bloomer Award
Dr M. J. Roberts

Dr Mike Roberts was until recently a busy general practitioner and a consultant in Medical Acupuncture. Notwithstanding the time-consuming burdens of community medicine, he has managed to find the time to write and illustrate a definitive work entitled *The Spiders of Great Britain and Ireland.* This impressive three-volume work takes its place among the fine tradition of classic works on British spiders, the frequency of which seems to be working out at two per century!

Michael J. Roberts was born in Leicestershire in 1945. He was educated at Dixie Grammar School, Market Bosworth and Sheffield University Medical School. His love of nature began at an early age and, as his mother was an artist, it was natural for him to draw, paint and observe. His interest in natural history became focused on spiders when he was in his second year as a medical student.

To the uninitiated, spiders can look remarkably alike but Mike has shown that this is quite untrue. He has developed a style of greatly enlarged, full colour

illustrations of the different species as they would appear in spirit, under the microscope, and with all the colour of the living-specimens. In using the microscope for the production of so many large illustrations of individual arthropods, the study perhaps breaks new ground. The 237 plates, almost exotic in their richness of colour and pattern, took many years to complete and now appear in volume three. Volumes one and two describe and illustrate all 630 British species with text figures depicting in great detail the important structures. At first, the illustration of a whole spider might have taken a week or more of spare time (often after midnight) but with practice and better equipment the time was reduced to eight hours.

Although an amateur, Mike is internationally known as an arachnologist. He has written important papers on the spiders of Seychelles and Aldabra. However, besides the taxonomic works he has contributed much on the practical aspects of arachnology such as the one, in co-authorship with his wife Debbie, which described novel methods of sampling spiders from tree trunks and which was entitled *Don't forget those trees!*

For many years now Mike has been an active member of the British Arachnological Society. In 1987 he became the secretary and the society is currently benefiting from his stimulating leadership. In 1990 Mike and Debbie are moving to the Highlands of Scotland following the sale of their medical practice in Sheffield. Possibly Mike will now find the time to have a go at his quoted wish: "I would dearly like to turn some of these spider structures into sculpture . . ."

The Jill Smythies Award
Miss Gillian Sara Condy

Gillian Condy was born in Nairobi and received her primary education there and in Kampala. She came to the U.K. with her parents in 1964 and after secondary schooling in Bournemouth studied at the Bournemouth College of Art and then for a diploma in graphics and scientific illustration at the Middlesex Polytechnic. She then completed a Master's degree at the Royal College of Art with a project on 'British Poisonous Plants'.

From 1978–82 she worked in Botswana mainly as an artist with the Ministry of Education and from 1983 has been employed as botanical artist with the Botanical Research Institute, Pretoria. As the only artist in the Institute, Miss Condy contributes to nearly all the Institute's publications, namely *The Flowering Plants of Africa*, *Flora of southern Africa*, *Palaeoflora of southern Africa*, and *Bothalia*.

Her contributions therefore range from black and white line drawings to delicate water-colour paintings. Following in the footsteps of the late Cythna Letty, doyenne of South African botanical artists, Miss Condy has done much to raise the standard of botanical illustration in the Institute's publications as well as the country as a whole.

Besides complementing and enhancing the work of professional botanists, she has produced a set of stamps of fungi and another of endangered species for the Botswana Post Office and has portrayed state and provincial emblems of South Africa (trees and flowers) for the publishers Van Rensburg. She is undoubtedly a most worthy recipient of the Jill Smythies Award for 1990.

The Bicentenary Medal
Charles Edward Jarvis

Charlie Jarvis discovered plant taxonomy through an early attraction to cacti and succulents, of which he built up a fine collection at his parents' home in Cardiff. Like many taxonomically-orientated school leavers in the early 1970s he was drawn to the Department of Botany at the University of Reading which he entered in 1972, the year the Department migrated from London Road to its present site on the Whiteknights campus. An immediate contemporary was Peter Crane, now at the Field Museum of Natural History in Chicago, who received the Bicentenary Medal in 1984.

Graduating in 1975 with an honours degree in Botany, Charlie stayed in Reading and enrolled for the M.Sc. course in Plant Taxonomy. Although he almost contrived to return to his botanical roots through project work on the Asclepiadaceae he instead undertook a study of pollen morphology in the Cotuleae, a group of the Compositae, a family then under much study at Reading. This study was proposed by Chris Humphries from whom Charlie also learned of cladistics, a word then little mentioned in the corridors of the Botany Department. Remaining with this family, and now firmly embedded in the Department, he then registered for a Ph.D. and began a revision of the genus *Tolpis*. This took him into the field in the Canary Islands, where a number of endemic *Tolpis* species grow and Charlie's thesis, submitted in 1980, was a fine example in the classic Reading mould: a comprehensive monograph incorporating much new data from cytology, palynology and phytochemistry.

After seven and a half years as a student at Reading (not a record, but a substantial stay) he left to take up a post in the Conservation Unit at Kew where he coordinated the gathering of data on endangered African plants.

Late in 1981 he began work on the Linnaean Plant Name Typification Project under the auspices of the Society and funded by S.E.R.C. The meticulous and energetic style he brought to this project soon made his expertise much sought after. The Project has gone from strength to strength, and Charlie has become a prolific botanical writer who publishes with an impressive international host of collaborators from as far apart as Leningrad and Maryland. He has also been successful in gaining a number of research grants in support of the Project, notably from the National Science Foundation and the Swedish Linnaean Society. It is particularly through his excellent work on this appropriately Linnaean project that he is a more than worthy recipient of the Linnean Society Bicentenary Medal.

Whilst his career has been that of a single-minded and resolute botanist, Charlie has many other interests and accomplishments. He is a superb cook, although the fortunate guests in his home will frequently find themselves drafted into the role of assistant chef and be required to labour in the kitchen before gaining their rewards. This prowess is all the more impressive because as a research student he was noted by his house mates for the odoriferous effects of grilling mackerel, then apparently his principal leisure activity. His expertise in wine was acquired through marriage (to Fiona Wild, the wine writer), and meticulous study. Charlie also enjoys travel, he reads avidly and has a wide-ranging passion for music, from Tchaikovsky to Buddy Guy. He regards motorcycling as a hobby.

All who have had the pleasure of working with him will know that there could scarcely be a more considerate or capable botanist.

The Irene Manton Award
Ms Christine Masterson

The first recipient of this prestigious award for the best botanical thesis in a British University is to go to Ms Christine Masterson of the Botany Department, University of Newcastle upon Tyne, for her work entitled 'Carnitine and Fatty Acid Metabolism in Higher Plants', undertaken during the period October 1985 to September 1988.

By the terms of Prof. Manton's bequest, part of the prize must consist of a piece of antiquity or sculpture. Professor Manton was a keen collector of antiquities and it is appropriate she would wish to convey something of her own excitement to the recipient of her gift each year.

This year, the piece of antiquity chosen consists of a small red-figure arabyllesque lekithos decorated with palmettes and an iris, dated around the end of the sixth century BC and probably manufactured in Athens at the beginning of the red-figure period (*c.* 500 BC). This period overlaps with the earlier black-figure period which began in the eighth century BC.

The red figure technique consists of painting a line drawing of a figure or other motif with a black glaze on to a red clay. The technique of manufacturing and applying this remarkable black glaze is unknown. It is known to contain potash or soda, aluminium silicate and iron oxides. Following the line drawing, the background features are then filled in with the black glaze.

This type of lekythos is slightly unusual in that it is of an intermediate design between the earlier spherical arabyllos and the later straight shouldered lekythos. They were usually used by women in domestic life or occasionally in funeral rites for carrying and applying perfumed oils. The decoration on this vessel suggests that it was used to convey iris perfumed oil which was one of the most important. A similar type of lekythos was depicted in use in this way on later more elaborate figured vessels.

It is a salutory thought that this piece of pottery was made nearly 2500 years ago, before most of our Western history, music, art and religion, which we feel sure is part of the excitement which Prof. Manton would have wished to convey.

Foreign Member
Eviatar Nevo

Professor Eviatar Nevo was born in Tel-Aviv, Israel and studied biology at the Hebrew University in Jerusalem. He is currently Professor of Biology at the University of Haifa where he is also Director of the Institute of Evolution. Between academic posts in Israel he has had sojourns to the U.S.A. where he has held a post as Visiting Professor in Zoology at the University of Texas, a Fellowship at Harvard and been a Research Associate at the University of California, Berkeley.

Professor Nevo is a true biologist with wide-ranging interests and experience in many fields. He is the author of some 310 papers on evolutionary biology with major interests in speciation and evolution in frogs, insects and, primarily, in mammals. He has maintained a multi-disciplinary approach to his studies which have embraced morphology, physiology, biochemistry, genetics, ecology and behaviour, and where practical and theoretical approaches have been closely linked. His researches into genetic diversity in natural populations of plants and

animals have included studies in such diverse fields as crop improvement, the quality of the marine environment, the genetics of behaviour, biological control and conservation.

Professor Nevo is also an accomplished palaeontologist and geologist. His studies of fossil frogs lead to the award of Ph.D., and he took part in extensive mapping programmes in southern Israel, including the Negev Desert, during which new phosphate, copper and iron deposits were unearthed.

Treasurer's Report

In presenting to this Anniversary Meeting the audited Financial Statements for the year ended 31 December 1989 I want, first of all, to pay warm tribute to my predecessor Charles Hutt. As Treasurer from 1979 to 1989, and before that in establishing the Society's excellent partnership with Academic Press, Charles made major contributions to the wellbeing of the Society. His vision and hard work have, in no small measure, brought about a remarkable change in the Society's finances. The situation now is quite different from that which I, and other senior citizens I see here today, remember of the Society 25 years or more ago.

For the Society, 1989 was a year of change, not only in the office of Treasurer but also in the office of the Executive Secretary and his supporting staff. Last year, and on previous occasions, Charles Hutt paid a well-deserved tribute to Sue Darell-Brown who, among other duties, kept the Society's accounts in an admirable manner. Sadly, she decided to move to Cornwall and a new member of staff was appointed shortly before Sue left us on 31 March 1989. Regrettably, when I took over as Treasurer last May, it became apparent that our accounts were not being kept as they should have been and, after consultation with John Fiddian-Green, I decided to call in our professional auditors to examine our books and prepare accounts for the six months to 30 June 1989. Their report, which became available soon after John Marsden took over as Executive Secretary, revealed that there had been deficiencies and delays in book-keeping and other matters. The report, however, also provided the Executive Secretary and myself with an excellent basis for our management of the Society's finances. We were fortunate too in obtaining from September 1989 the services of Sue Darell-Brown on a 2-days-a-month basis for book-keeping and other financial duties.

The Expenditure side of our Income and Expenditure Account (page 2 of the Financial Statements) shows for 1989 a substantial increase over 1988. This was partly due to the changes and difficulties to which I have just referred. I am, however, confident that these difficulties have been overcome and that expenditure on items such as Staff Recruitment and Financial Services will be significantly less in 1990. Another large increase in the Expenditure Account in 1989, compared with 1988, was for Scientific Meetings; the reason here is that in 1988, our Bicentenary Year, most of such expenditure was covered by the Special Provision for Bicentenary Expenses (see Note 2 on page 3); under this heading our expenditure in 1989 was, naturally, much less. The Accounts also show a substantial increase in expenditure on the Library; this was intentional although, with wisdom of hindsight, I think some of the expenditure might

properly have been set against the Provision for Special Library Expenses (see Note 3 on page 3) which my predecessor prudently put aside. A major item of expenditure here was for re-binding our copy of *Flora Graeca.*

On the Income side of the Income and Expenditure Account you will note a healthy increase of nearly £38K over the previous year. The main elements here were: — (i) an increase in Annual contributions (due to Fellows paying extra for a second journal and to our Fellowship increasing by over 100 in the year); (ii) increased dividends and interest; and (iii) an extra £15K on Publications. The latter was due largely to the new system whereby Fellows pay extra if they wish to receive a second journal; we are also much indebted to Academic Press, our Editors, and all who contribute papers, for the way in which the number of subscriptions to our journals has been maintained. On another point, Fellows may like to know that the item Facilities for Premises refers to payments made by the British Ecological Society, the Society for Experimental Biology and the Institute of Sports Medicine in respect of the small offices they have within our premises. The item Use of Rooms covers payments made by numerous kindred organizations who use our lecture and committee rooms for their meetings. May I add here that, as the Linnean is the only biological society to enjoy the privilege of accommodation provided rent-free by Government, I look forward to seeing our splendid rooms used even more by other societies.

In spite of the difficulties of 1989 we finished the year with an Excess of Income over Expenditure of £24 900 which, as you will see in Note 4 (on page 3), has been transferred to the General Fund. This Fund has also benefited by a further £100 000 from the Irene Manton Estate and the transfer of the balance from the Provision for Bicentenary Expenses.

Turning now to the Balance Sheet (page 1), you will note that our Assets have increased substantially and that our investments at Market Value on 31 December 1989 amounted to £887 172 for General Funds and £200 610 for Trust and Special Funds. Together they exceeded £1 million for the first time in the Society's history. Since the end of last year the stock market has fallen considerably and our investments are now somewhat less than £1M. I would also draw attention to the Schedule of Investments for the Trust and Special Funds (page 8); for the first time this shows the market value as well as the book value of each fund; the growth in value of the older funds is, indeed, gratifying.

I am sure that we would all wish to see this favourable situation maintained, but to do so we must take due account of the present level of inflation which is now over 10%; for publications, which are such an important part of our finances, inflation has in the past and may be expected to continue to be above the Retail Price Index. In the next few months Council will, therefore, need to give serious consideration to increasing the levels of Annual Contributions with effect from 1992.

Finally, I want to thank the Executive Secretary for the excellent way he and his staff have kept our accounts, our professional auditors and our Finance Committee, among whom we are particularly indebted to Roger Goodenough for continuing to oversee our investments.

May 1990 R. W. J. KEAY

Executive Secretary's Report

The three areas of concern to the Executive Secretary are the staff, the premises and equipment.

Staff

The Society employs five staff and a part-time financial consultant. Their combined salaries are half the Society's expenditure.

Administrative Assistant: Miss Marquita Baird. Deals with meetings, room bookings, rents, stationery and book sales.

Executive Secretary: Dr John Marsden. Deals with meetings of the Society's committees and Council, except the Library Committee; day-to-day correspondence and financial matters, maintenance of premises and plant; staffing matters.

Part-time Financial Consultant: Miss Sue Darell-Brown. Maintains the Society's books and prepares them for annual audit.

Housekeeper/Library Assistant: Mrs Ekaterina Dimitrova. Responsible for security outside working hours, refreshments for meetings within the Society's rooms and helping the Librarian.

Librarian: Miss Gina Douglas. Deals with all matters relating to the Library and the Collections. Services the Library Committee.

Membership Officer: Miss Maria Polius. Maintains the membership records and deals with subscription matters. Deals with petty cash.

Premises

In general these are in good shape, thanks to the efforts of my predecessor and given the age of the building. Across the courtyard, we house the BES and SEB in two rooms. Cleaning is now done by a commercial company for £3500 p.a. A programme of continuous refurbishment must be maintained. The offices and toilets have been redecorated, and the main areas (library, staircases, foyer and toilets) have been springcleaned. The costs of these are not negligible—over £5000. A rolling stack in the East Basement, together with some redecoration and new electrics will be the next task. The next target for redecoration is the Library annexe. A kitchen area would be useful. I have recently learned that refurbishment of the lift alongside the Society's rooms may not be too expensive. At one time it served the Council Room. I shall be following this up with the RSC.

Equipment

Potentially, this could be our biggest headache. Our computers and associated software are obsolescent, and in the next couple of years will not be serviceable. The Membership List is the biggest problem; whilst the hardware can be replaced for £6–7K, moving the list might cost considerably more. New printers will add a similar amount to the bill. *The longer we leave this, the more difficult it is likely to prove.*

Other equipment is not so worrying. One of the two air-conditioning units (that for the Archive Room) is functioning (since mid-December) and a service contract has been agreed. Inspections have been carried out on the Meeting Room system, and the problem identified. It remains to be solved.

AVA equipment gets a lot of use. Carousels are being replaced at six-monthly intervals. One projector is not in first rate optical condition. Another projector would allow us to use the Council Room for slides. The PA system is capable of being matched to almost anything. We either hire or borrow (from the RSC) video. In nine months, this has been required only four times, at a cost of £150.

Insurers for the contractors have agreed to meet the costs of making good damage to books, furniture and decoration as a result of water penetration. This runs to £12K. Agreement has also been reached to repair the books damaged in the Archive Room as a result of a fault with a dehumidifier, a further £10K. The dehumidifier has now been removed.

General

It cannot be said that there is anything seriously amiss with the Society's staff, premises or plant. Our membership continues to burgeon, and is now over 2000. However, as the Society expands its activities to larger, longer meetings, to diversification of publications, to a higher national profile in biology and to increased support of research and publication, there is a danger that there will not be the support to carry them through in the way that members would wish. Staff already have long hours and high workloads. In considering increased activity, attention will need to be paid to support and its costs.

Meetings

It has been traditional that the Executive Secretary report on the meetings which have been held here. It is a pleasure to report that almost all scientific meetings of the Society have been well attended, with an average attendance of 80. It has been annoying that so many people who book up for popular topics do not come or cancel; we operate an overbooking system, which will one day come to grief. It has been used three times this year, sucessfully. Although concerned largely with the mechanics of meeting organization, I have to say that I believe the Programmes Committee, and its retiring Chairman, have done a great job in putting together an attractive programme, and it is significant that evening scientific meetings have been well attended. The Gaia debate was a singular success in these terms. It is disappointing that so few of the proceedings of longer meetings are published by the Society.

The Sixth Form programme of six lectures and a day meeting seems to start well, in terms of attendance, but tapers off as examinations draw near. Those who have come have certainly enjoyed presentations of the highest quality, of relevance to their studies.

It is a particular pleasure to report close cooperation between meetings organizers and the office and to thank all those who have proved so helpful in the preparation and running of meetings.

Conversazione 1990

Some 160 people, the majority guests of the Society, attended the 1990 Conversazione. There was a preview of the video of the Kimberley Expedition, made by the Ministry of Education, Western Australia and dedicated to the expedition's Director of Operations, David Pascoe, who died shortly after the expedition was completed. The Society of Botanical Artists mounted a display in

the Library of over a hundred examples of its members' work. Six displays were mounted in the Council Room: these are listed below.

(1) *Love Songs of Planthoppers.* Professor M. F. Claridge, P.L.S. and J. C. Morgan, School of Pure and Applied Biology, University of Wales, Cardiff.

Planthoppers feed exclusively on green plants, usually by piercing and sucking from phloem. In courtship males and females exchange species specific acoustic signals transmitted through the plant substrate. Such signals can be detected by simple vibration receivers and recorded on magnetic audio or videotape. They can be replayed into plants and the response of the insects monitored. We shall display the acoustic behaviour of the the Brown Planthopper, *Nilaparvata lugens (Stal)*, a major pest of rice in Asia, and a very closely related sympatric sibling species from the grass, *Leersia hexandra.* Also calls of the morphologically distinct, but related *N. bakeri* (Muir) will be demonstrated.

(2) *Re-discovery of a Scarlet Tiger Moth* (Panaxia dominula) *Colony after 28 'Undisturbed' Years on the Wirral Way, West Kirby, Merseyside.* Sir C. A. Clarke, F.L.S., Merseyside.

Details on the moths sampled in 1989 and 1990 will be shown and the hypothesis put forward that catching, handling, and/or marking and releasing, 'disturb' the mutant forms more than the wild type *dominula.*

(3) *Eoteuthis—The Oldest Squid.* Professor D. T. Donovan, F.L.S.

This fossil from slates of lower Devonian age (about 400 million years old) is known only from an *X*-ray photograph that shows a conical animal with tentacles. It has been interpreted as a fossil squid (i.e. a shell-less mollusc), but it is nearly 200 million years earlier than any related fossils. So what is it?

(4) *An Illustrated Flora of Seedlings of Panama with Special Emphasis on Barro Colorado Island.* Nancy C. Garwood and Margaret Tebbs, F.L.S., Department of Botany, Natural History Museum, Cromwell Road, London SW7 5BD.

The seedling Flora Project has three main objectives: 1. To describe and illustrate the fruits, seed and seedlings of species growing in lowland, semi-deciduous forest of Central Panama. 2. To collect and evaluate data on seed germination, and seedling growth and survival rates. 3. To review seed and seedling ecological literature. Germination and seedling growth and survival will also be examined from an ecological perspective at the community level. This combined taxonomic and ecological study has important and relevant implications for the future of tropical forest management and conservation.

(5) *DNA Analysis as a Taxonomic Tool.* Margaret Steentoft, F.L.S., Marine Laboratory Hayling Island, J. H. Price. Natural History Museum, P. Gactesa, University of Cardiff.

Gracilaria is an economically important genus of red seaweeds, with over 100 ill-defined species. In Britain the compressed *Gracilaria bursa* (Pastoris) and the flat *G. folifera* (= *G. multipartita*) are easily recognized, but morphological analysis suggests that there are two terete species of *Gracilariopsis* at present being confused with the terete *Gracilaria 'verrucosa'*. Endonuclease analysis of amplified rDNA corroborates the delimination of these taxa arrived at on morphological criteria. The method can be used on any dried material including type specimens.

(6) *Reproduction of the Plates of the Hortus Floridus by Crispin van der Pass.* Mrs J. Gladstone.

The Society is grateful to all who contributed to the success of the occasion, including the Royal Botanic Gardens, Kew for breathtaking flower arrangements. It is to be hoped that other members will be encouraged by these examples to put forward exhibits for the 1991 Conversazione on Wednesday 12 June.

JOHN MARSDEN

The Linnean Society of London
Balance Sheet
31 December 1989

31st December 1988 £	ASSETS	£	£
458,826	**Investments** (as per schedule) (Market Value: 31 December 1989; £887,172) (Market Value: 31 December 1988; £664,969)		581,138
48,936	**Sundry Debtors**		68,320
2,503	**Share of Stock held on Joint Publishing Account** (at valuation)		—
21,551	**Deposit and Current Account balances**		24,324
531,816			673,782
	Less: Current Liabilities		
22,179	Contributions received for future years	26,553	
77,211	Provision for Repairs and Improvements (Note 1)	74,338	
21,011	Provision for Bicentenary Expenses (Note 2)	—	
16,358	Provision for Special Library Expenses (Note 3)	11,001	
23,676	Sundry creditors and provisions	28,323	
160,435			140,215
371,381			533,567
	Trust and Special Funds		
50,188	Investments (as per schedule) (Market Value: 31 December 1989; £20,610) (Market Value: 31 December 1988; £144,124)	80,320	
33,727	Deposit and Current Account balances	26,072	
83,915			106,392
£455,296			£639,959
	Represented by:—		
	General Funds		
352,252	General Fund (Note 4)	516,040	
19,129	Publications Fund (Note 5)	17,527	
371,381			533,567
	Trust and Special Funds		
83,915	Balance of Funds		106,392
£455,296			£639,959

R. W. J. Keay — Treasurer
M. F. Claridge, B. J. Ford, T. Pain, P. S. Rainbow — Audit Committe

26 April 1990.

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 given a true and fair view of the state of the Society's affairs at 31 December 1989 and of its results and source and application of funds for the year ended on that date.

4, London Wall Buildings
LONDON EC2M 5NT
26 April 1990

FRASER & RUSSELL
Chartered Accountants

Income and Expenditure Account for the year ended 31 December 1989

1988 £		£
	INCOME	
51,310	Annual contributions received	58,069
941	Income tax recoverable on covenanted contributions (year to 5th April 1989)	799
35,381	Dividends and interest	42,280
4,419	Publications—sales of back issues	4,704
1,137	Donations received	1,204
7,597	Use of rooms	7,661
10,349	Facilities of Premises	10,970
2,570	Miscellaneous receipts	1,991
3,816	VAT recoverable	2,880
485	Royalties	90
36,557	Publications (Note 8)	51,709
£154,562		£182,357
	EXPENDITURE	
655	Scientific Meetings	5,852
499	Medals	1,077
3,664	Library—books and periodicals	5,609
944	binding repairs and cleaning of books	1,664
2,908	cataloguing	2,089
6,948	Newsletter (*The Linnean*)	7,323
1,750	The List and Bye Laws	2,730
1,904	Roll & Charter Book	—
63,022	Salaries and National Insurance	77,864
—	Staff Recruitment Costs	6,077
4,945	Financial Services (including audit fees)	10,214
7,446	Printing, stationery, postage and telephone	9,544
	Photocopying	1,286
	Office Equipment	600
7,858	General Rates	8,324
6,420	Electricity and Gas	6,605
4,070	Repairs, Renewals and Insurance	4,769
3,171	Expenses of Officers and Council	1,763
	Miscellaneous	4,037
£116,204		£157,427
£38,358	Excess of Income over Expenditure for the year	£24,930

Notes to Accounts—31 December 1989

1988 £		£
Note 1	**Provision for Repairs and Improvements**	
80,000	Balance at 1 January 1989	77,211
2,789	Expenditure during year	2,873
£77,211	Balance at 31 December 1989	£74,338

Note 2	**Provision for Bicentenary Expenses**	
47,970	Balance at 1 January 1989	21,011
26,959	Expenditure during year	1,448
£21,011	Balance Tranferred to General Fund	£19,563

Note 3	**Provisions for Special Library Expenses**	
20,000	Balance at 1 January 1989	16,358
3,642	Expenditure during year	5,357
£16,358	Balance at 31 December 1989	£11,001

Note 4	**General Fund**	
38,358	Excess of Income over Expenditure for the year	24,930
150	Composition fees received during the year	150
13,889	Gain on changes of investments during the year	44,141
6,211	VAT recoveries for prior years	—
73,305	Irene Manton Estate—interim distributions	100,000
—	Transfer to Irene Manton Special Fund*	(24,996)
858	Other Legacies	
—	Transfer from Bicentenary Expenses Provision	19,563
219,481	Balance at 1 January 1989	352,252
£352,252	Balance at 31 December 1989	£516,040

*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 5	**Publication Fund**	
17,655	Balance at 1 January 1989	19,129
6,256	Transfer from Joint Publishing Account (less due to other Societies £31)	2,780
23,911		21,909
4,782	*Less*: Transfer to Publications Account	4,382
£19,129	Balance at 31 December 1989	£17,527

Note 6 No value is attributed to the Library, furniture, office equipment and stock of unsold journals in this Balance Sheet. Costs of acquisitions are written of as incurred.

Note 7 Annual contributions in arrears at 31 December 1989 amounted to £3,916 (31 December 1988 : £2,102; 75% of this was paid in 1989).

1988		
Note 8	**Publications Account**	**£**
86,382	Half share of surplus on 1989 Joint Publishing Account—Journals	98,001
4,782	Transfer from Publications Fund	4,382
(1,307)	E. J. Brill	832
89,857		103,215
	Less:	
50,691	Contributions to Joint Publishing Account and distribution cost for Journals –Fellows	48,524
2,609	Editorial expenses	2,982
53,300		51,506
£36,557	Surplus transferred to Income and Expenditure Account	£51,709

Joint Publishing Account with Harcourt Brace Jovanovich Ltd.
Income and Expenditure Account for the Publishing Year ended 31 December 1989

1988			
£		£	£
	Sales		
332,240	Journals (including Linnean Society contributions)		363,110
17,156	Books		13,774
£*349,396*			£376,884
	Stock at 1 January 1989		5,006
	Production Costs		
159,477	Journals		167,108
9,522	Books		3,145
168,999			175,259
5,006	*Less:* Stock at 31 December 1989		
£*163,993*			£201,625
	Gross Profit for year		
92,702	Harcourt Brace Jovanovich Ltd.		100,812
	Linnean Society		
86,382	Journals	98,001	
6,320	Books: Publications Fund	2,811	
92,702			100,812
£*185,404*			£201,624

Trust and Special Funds for the year ended 31 December 1989

	Deposit and current account balances at 1 January, 1989	Income		Grants, awards transfers and sundry expenses	Expenditure		Deposit and current account balances at 31 December, 1989	Investments at book value
		Dividends interest and income tax recovered	Investment sales royalties or other receipts		Purchase of investments	Administration contribution		
	£	£	£	£	£	£	£	£
Jill Smithies Award	3,231	167	-	137	3,275	12	(26)	3,275
P. Appleyard Bequest	6,614	2,621	-	464	—	207	8,565	8,203
The H. H. Bloomer Award Trust	967	493		194	—	40	1,225	1,168
Bonhote Fund	1,571	1,092	3,987		3,981	107	2,561	7,701
Goodenough Fund	272	358	150	315	—	—	466	2,461
Hooker Lecture Fund	1,417	394	-	—		30	1,780	983
Minchin Fellowship Fund		47			—	—	47	120
Dennis Stanfield Memorial Fund	973	534	2,000	—		37	3,470	3,134
Trail - Crisp Award Fund	222	147				11	357	336
Westwood Fund	220	199	—	-	—	17	403	875
Jane Jackson Bequest	—	2,397		-		—	2,397	4,088
Omer -Cooper Fund	2,048	1,811				174	3,686	12,860
Flora Europaea Fund	16,192	1,080	3,164	19,091		204	1,141	10,120
Irene Manton Bequest	—							24,996
	£33,727	£11,340	£9,301	£20,201	£7,256	£839	£26,072	£80,320

Schedule of Investments 31 December 1989

Nominal		**General account**	Book Value £
£12,020.00		Treasury 3% Stock 1991	9,678
£45,695.00		Treasury 3% Stock 1992	39,026
£20,000.00		5% Funding Stock 1987/91	19,164
£24,500.00		6% Funding Stock 1993	21,683
£10,000.00		Treasury 9% Stock 1994	7,272
58,000	Units	Allied Dunbar UT European Growth Trust	15,196
5,950	Shares	Attwoods 5p Ordinary Shares	24,992
£5,916.00		Barclays Bank Plc Ordinary Stock	10,217
4,250	Shares	B.A.T. Industries Plc 25p Ordinary Shares	3,963
8,000	Shares	Boots Co. Plc 25p Ordinary Shares	10,475
7,300	Shares	BTR Plc 25p Ordinary Shares	22,429
32	Warrants	BTR Plc for Ordinary Shares	18
5,500	Shares	Cable & Wireless 50p Ordinary Shares	20,428
6,000	Shares	Cadbury Schweppes Plc 25p Ordinary Shares	4,620
3,990	Shares	Commercial Union Assurance Co.	12,934
20,600	Shares	Dale Electric International 10p Ordinary Shares	28,103
10,350	Shares	General Electric 5p Ordinary Shares	24,992
6,000	Shares	Glaxo Holdings Plc 50p Ordinary Shares	2,032
8,000	Shares	Glynwed International 25p Ordinary Shares	24,999
1,250	Units	GUS "A" Ordinary Stock	7,700
15,100	Shares	Hanson Trust Plc 25p Ordinary Shares	18,920
28,000	Units	Henderson UT Management European Income Trust	14,476
710	Shares	Hillsdown Holdings Plc 10p Ordinary Shares	1,917
1,840	Shares	ICI Plc £1 Ordinary Shares	14,562
12,000	Shares	Inchcape 25p Ordinary Shares	28,906
1,800	Shares	Marks & Spencer Plc 25p Ordinary Shares	3,105
5,250	Shares	Northern Foods Plc 25p Ordinary Shares	3,880
£ 460		P & O Plc 5% Cumulative Deferred Stock	2,659
30	Warrants	P & O Plc for Deferred Stock	46
£11,000.00		Scottish Mortgage & Trust Plc 8-14% Stepped Deb.	11,083
11,000	Shares	Sedgwick Group 10p Ordinary Shares	27,017
6,870	Shares	Shell Transport & Trading Co. Plc 25p Ordinary	8,330
£5,689		Smithkline Beecham Floating Rate Unsecured Loan Stock 90/82	4,019
2,854	Shares	Smithkline Beecham 25p 'A' Ordinary Shares	10,869
9,000	Shares	Tarmac	29,008
10,730	Units	The Equities Investment Fund for Charities	16,711
9,600	Shares	Trust House Forte 25p Ordinary Shares	27,940
4,745	Shares	Unilever Plc 5p Ordinary Shares	16,543
		Uninvested cash held by James Capel	23,044
		National Savings Bank—Investment Account	8,182
			£581,138

(Market Value 31 December 1989 £887,172)

Trust and Special funds

			Book Value £	Market Value £
		The Equities Investment Fund for Charities:		
5,891	Units	P. Appleyard Bequest	7,267	35,458
1,180	,,	The H. H. Bloomer Award Trust	971	7,102
2,476	,,	Bonhote Fund	6,922	14,903
935	,,	Goodenough Fund	2,461	5,628
843	,,	Hooker Lecture Fund	983	5,074
126	,,	Minchin Fellowship Fund	120	759
1,108	,,	Dennis Stanfield Memorial Fund	3,058	6,669
371	,,	Trail-Crisp Award Fund	336	2,233
522	,,	Westwood Fund	759	3,142
6,496	,,	Jane Jackson Bequest	4,088	39,099
4,453	,,	Omer-Cooper Fund	8,589	26,694
2,433	,,	Flora Europaea Fund	6,555	14,644
558	,,	Jill Smythies Award	3,275	3,359
4,304	,,	Irene Manton Bequest	24,996	25,906
31,678			70,380	190,670
		National Savings Bank—Investment Account	9,940	9,940
			£80,320	£200,610

Source and Application of Funds Statement for the year 31 December 1989

	General Funds		Trust Funds	
	1989	*1988*	*1989*	*1988*
Source of Funds	£	£	£	£
Excess of Income over Expenditure for the year	24,930	38,358		
Other Sources of Income				
Composition fees received	150	150		
Investments sale proceeds	78,867	25,007	9,301	18,000
Legacies	100,000	74,163		
VAT recoveries for prior years	—	6,211	—	—
Decrease in Debtors		16,524		
Net Transfer to Publications Fund		1,474		
Decrease in Share of Stocks Held	2,503	—		
Increase in Sundry Creditors	4,546	5,784	—	
Increase in Contributions received for future years	4,374	1,223		
	215,470	168,894	9,301	18,000
Application of Funds				
Additions to Investments	157,037	150,290	7,256	1,357
Repairs and Improvements Expenditure	2,873	2,789		
Bicentenary Expenditure	1,448	26,959		
Special Library Expenditure	5,357	3,642	—	
Increase in Share of Stocks held		2,503		
Increase in Debtors	19,384			
Net Transfer from Publications Fund	1,602			
Transfer for Irene Manton Prize Fund	24,996	—	—	—
Trust Funds Excess of Expenditure over Income			9,700	11,141
	212,697	186,183	16,956	12,498
Movement in Cash Deposit and Current Account balances	2,773	(17,289)	(7,655)	5,502
Balances at 1 January	21,551	38,840	33,727	28,225
Balances at 31 December	£24,324	£21,5551	£26,072	£33,727

Library

The summer months have, once more, been used to reshelve journals, this time in the East Basement area where one room has had to be cleared completely for installation of new 'Compacta' style shelving which should give us increased storage capacity. By the time this is due to appear this work should have been completed and some of the journals back in place. This may delay finding some of the larger journals originating outside western Europe as these are the ones which have been temporarily removed. Once more we are grateful for student help, especially from Martin Forejt from Prague, in his first year of Library studies.

Readers will now be able to find most of the recent accessions in the Card Catalogue as we have now produced and filed cards for accessions since 1984. Bruce Ritchie is now working on the 'gap' between 1979 and 1984 when entries were only made on temporary cards.

Donations

Apart from those listed below, we continue to express our thanks to those who regularly bring us in books and journals to supplement our holdings. These include R. Fitter, P. Tuley and Professor G. P. A. Pontecorvo. We have also had 12 boxes of natural history journals and books from the Fauna and Flora Preservation Society, most of which have now been catalogued. We would also like to express our special thanks to the Swedish Academy of Sciences for replacing all of their publications which were damaged in the flooding at the end of 1989.

Dr D. E. Allen	Wyse-Jackson, P., Moriarty, R. & Akeroyd, J. R. (Eds), *In the field of Naturalists,* proceedings of a seminar... 72 p. map, Durham Naturalists Field Club, Durham, 1988.
A. J. Boerman	Boerman, Albert Johan, *Karsudden patientera en social och rattspsykiatrisk studie av 106 jamstallda lagovertaxadere.* (Thesis). 218 pp. Almqvist & Wiksell, Stockholm, 1989
J. Burton	Evans, John G., *The environment of early man in the British Isles.* 216 pp. illustr. maps, Book Club assoc. London, 1978.
	Godfrey, G. & Crowcroft, P., *The life of the mole.* 152 pp. illustr., Museum Press, London, 1960.
	Kellogg, Winthrop N., *Porpoises and sonar.* 177 pp. illustr., Chicago University Press, Chicago, 1961.
	Vesey-Fitzgerald, B., *The vanishing wild life of Britain.* 159 pp. MacGibbon & Kee, London, 1969.
Mrs M. Cooper	Farm Animal Welfare Council, *Report of the Environment Working Group.* 24 pp. + appendix. London, 1990.
Dr L. N. Derrick	Singh, S. A., *Insect pests of tropical food legumes.* 451 p. 11 col pl. J. Wiley, Chichester, 1990.
R. Fitter	Dassmann, Raymond F., *Environmental conservation,* 3rd edition. 473 pp. illustr. J. Wiley, London, 1972.

International Union for the Conservation of Nature, *United Nations list of National Parks and protected areas*: 1982. 154 pp. IUCN, Gland, 1982.

Montonen, Martii, *Suomen peura*. 117 pp. illustr. map, Porvoo, Helsinki, 1974.

Dr E. A. Flint — Croasdale, H. & Flint, E. A., *Flora of New Zealand*, Desmids, Vol. 1. 133 pp. illustr. Government Printer, Wellington, 1986.

Prof. G. Leclercq — Jacob—Remacle, Annie, *Abeilles sauvages et pollination*. 40 pp. illustr. some col. Fac. Sciences Agronomique, Gembloux, 1990.

Jacob—Remacle, Annie, *Abeilles et guêpes de nos jardins*. 48 pp. illustr. some col. Fac. Sciences Agronomique, Gembloux, 1990.

Dr J. Marsden — Chalmers, Irena, *Tea*. 48 pp. illustr. Potpourri Press, Greensboro', n.d.

Dr M. D. Merlin — Merlin, Mark David, *Man and marijuana*. 120 pp. illustr. A. S. Barnes, South Brunswick, 1973.

Prof. F. Pedrotti — Pedrotti, F., *Indici bibliografico dei periodici della Societa Botanica Italiana (1844–1986)*. 493 pp. Societa Botanica Italiana, Firenze, 1988.

Pedrotti, F., *100 Anni di ricerche botanica in Italia (1888–1988)*. 1124 pp. Societa Botanica Italiana, Firenze, 1988.

Dr G. Pilleri — Pilleri, G., *Beitrage zur paleontologie der Cetaceen und pinnipedier der Pisco formation*, Perus, II. 215. illustr. Hirnanatomisches Institut, Ostermundigen 1990.

Prof. R. E. Schultes — Schultes, Richard Evans & Raffauf, Robert F., *The healing forest: medicinal and toxic plants of the Northwest Amazonia*. 484 pp. illustr. Dioscorides Press, Portland, 1990.

Studio Editions — Dance, S. Peter, *Classic natural history prints: birds*. 128 pp. col. illustr. Studio Editions, London, 1990.

Dance, D. Peter, & Swinney, Geoffrey N., *Classic natural history prints: fish*. 128 pp. col. illustr. Studio Editions, London, 1990

Systematics Association — Systematics Association, *The Chromophyte Algae, problems and perspectives*, edited by J. C. Green, B. S. C. Leadbeater, and W. L. Diver. (Special Vol. No. 38) 429 pp. illustr. Clarendon Press, Oxford, 1989.

Systematics Association, *Scanning electron microscopy in taxonomy and functional morphology*, edited by D. Claugher. (Systematics Association Special Vol. No. 41). 315 pp. illustr. Clarendon Press, Oxford, 1990.

Akad. L. P. Tatarinov — Efimov, M. B. [*The fossil crocodiles and Champosauridae of Mongolia and the USSR*], Trans. joint Soviet-Mongolian Paleontological expedition, Vol. 36. add 105 pp. illustr. maps, Nauka, Moscow, 1988.

Stychevskaya, E. K. [*Paleogene fresh water fish fauna of the USSR and Mongolia*], Trans. joint Soviet-Mongolian

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Spring habitats

Spring habitats and their faunas: and introductory bibliography has just been published by the Biological Survey of Canada (Terrestrial Arthropods). The bibliography is intended to facilitate access to the available literature on springs, and to stimulate interest in further research that will contribute to the scientific understanding and conservation of spring ecosystems. There are 1762 citations, listed alphabetically. These include basic references to geographical, physical and chemical aspects of springs and a more detailed treatment of biological subjects, including faunal studies of hyporheic habitats, which resemble springs in origin, composition and ecology. Subject, geograpic and taxonomic indexes are provided. The volume (156 pp., $6\frac{1}{2}'' \times 10''$) is available only from the Entomological Society of Canada, 1320 Carling Avenue, Ottawa, Ontario, Canada K1Z 7K9 at a cost of CDN $9.00 plus $3.50 postage and handling.