THE ZOOLOGICAL SOCIETY OF LONDON

Annual Report 1984

Published by

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The Zoological Society of London was founded in 1826, largely as the result of the energy and initiative of Sir Stamford Raffles, Sir Humphry Davy (President of the Royal Society) and eminent naturalists. It was incorporated by Royal Charter in 1829, its stated purpose being

'the advancement of Zoology and Animal Physiology and the introduction of new and curious subjects of the Animal Kingdom'.

A new Charter was granted to the Society in 1963.

The Society's Gardens in Regent's Park—now known all over the world as the London Zoo—were opened in 1828. A hundred years later the Society acquired and, in 1931 opened, Whipsnade Park, an area of some 500 acres of farm and downland where the rural setting forms a splendid background for animals that are able to roam in large paddocks. Whipsnade Park and the London Zoo are complementary and together house one of the finest and most comprehensive collections of wild animals in the world.

The Society was formed as a scientific society and this remains its prime purpose. Throughout its existence members of its staff, as well as many eminent zoologists and other visiting scientists, have studied material derived from the Collection and have made important contributions to our knowledge of taxonomy, comparative anatomy and physiology, human and veterinary medicine, pathology, ecology and animal behaviour. The Wellcome Institute of Comparative Physiology and the Nuffield Institute of Comparative Medicine were founded during the 1960's. These well-equipped laboratories, with the Veterinary Hospital and the Curators' research units, were joined in 1977 to form The Institute of Zoology, thus greatly extending the scope of research which can be undertaken by the Society.

Scientific meetings are held on the second Tuesday in the months February to June and October to December. At these meetings the results of new research are communicated and discussed, and specimens and films of zoological interest are exhibited. Symposia on special subjects are also arranged. The Society owns one of the finest zoological libraries in the world, which has been built up over the 158 years of its existence.

The Society's publications include:

The *Journal of Zoology* (the *Proceedings of the Society*). Three volumes (12 parts) are published annually containing papers which cover all fields of zoology.

The *Transactions* are published at irregular intervals.

The *Symposia* record the papers read at the Symposia.

The *Zoological Record*, a comprehensive bibliography of zoological literature with subject and systematic indices, is available either as a complete volume or separately in 27 parts dealing with the different animal groups. From Volume 115, the *Record* is published in conjunction with BIOSIS (BioSciences Information Service/Biological Abstracts, Philadelphia, USA).

The *Nomenclator Zoologicus* contains the names of all the genera and subgenera in zoology from the 10th Edition of Linnaeus 1758 to the end of 1965, with a bibliographical reference to the original description of each. The work contains approximately 280,000 entries and is published in 7 volumes.

The *International Zoo Yearbook*, published annually, provides authoritative information on developments in the zoo world.

Report of the Council

The Council has pleasure in presenting its 156th Annual Report to the Annual General Meeting of the Society to be held on 8th May 1985 at 4.00 pm in the Society's Meeting Room at Regent's Park.

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PATRON: HER MAJESTY THE QUEEN

COUNCIL 1984–1985

President: Sir William Henderson, DSc,. FRCVS, FRSE, FRS
Treasurer: The Rt. Hon. Lord Peyton of Yeovil
Secretary: R. M. Laws, CBE, PhD, FIBiol, FRS
E. D. Barlow, MA, MB, BChir, FRCPsych, *Vice-President*
Lady Casson, RIBA, FSIA
The Rt. Hon. Lord Charteris of Amisfield, GCB, GCVO, OBE, QSO
The Earl of Cranbrook, MA, PhD, FLS
Professor E. J. Denton, CBE, ScD, FRS
Sir Arthur Drew, KCB, JP
Professor B. K. Follett, PhD, DSc, FRS
R. H. Hedley, DSc, PhD, FIBiol, *Vice-President*
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Professor N. A. Mitchison, DPhil, FRS
C. J. Perrin, MA
C. E. Gordon Smith, CB, MD, FRCP, FRCPath
Professor Sir Richard Southwood, MA, DSc, PhD, ARCS, FIBiol, FRS
Sir Richard Way, KCB, CBE, *Vice-President*
H.G. The Duke of Wellington, MVO, OBE, MC, *Vice-President*
Professor L. Wolpert, DIC, PhD, FRS
Sir Philip de Zulueta, MA

HONORARY FELLOWS

Date of Election
1977 HRH The Prince Philip, Duke of Edinburgh, KG, KT
1971 His Majesty Emperor Hirohito of Japan, KG
1975 Professor Jean Anthony
Muséum National d'Histoire Naturelle,
55 rue de Buffon, Paris 53, France
1975 Professor L. D. Brongersma
Rijksmuseum van Natuurlijke Historie,
Leiden, Holland
1978 Professor José Carvalho
Museu Nacional,
Quinta da Boa Vista,
Rio de Janeiro, Brazil 20940
1957 Professor Robert Courrier
L'Institut de France (Académie des Sciences),
23 Quai de Conti, Paris 6, France
1945 Monsieur Jean Delacour
Parc Zoologique de Clères, Clères,
Rouen, S-M, France
1975 Professor Jean Dorst
Muséum National d'Histoire Naturelle
(Mammifères et Oiseaux),
55 rue de Buffon, Paris 53, France
1978 Sir Charles Fleming
Balivean, 42 Wadestown Road
Wellington, New Zealand
1978 Professor M. S. Ghilarov
Member of the USSR Academy of Sciences,
Institute of Evolutionary Morphology and Ecology of Animals,
Moscow 117071,
Leninskij Prospekt 33, USSR
1975 Dr Harry Hoogstraal
US Naval Medical Research Unit No 3,
c/o Embassy of the USA,
Cairo, Egypt
1952 Professor Sven Otto Hörstadius
Zoologiska Institutionen, Uppsala, Sweden
1974 Dr Roger Tory Peterson
Route 4, Box 131 Neck Road, Old Lyme, Connecticut, USA
1984 Professor Lord Zuckerman, OM, KCB, FRS
University of East Anglia, Earlham Hall, Norwich

Introduction by the President

My predecessor, Professor Lord Zuckerman, in his Forewords to the Council's Annual Reports, beginning with that for 1980 outlined, year by year, the Society's declining financial situation which resulted in the Government providing some measure of support in 1982, 1983 and 1984 with an assurance of further aid until 31 March 1986. The Secretary of State for the Environment in a statement to Parliament on 21 December 1983, announcing that the government had agreed to provide this support for up to three years added that the President and Council of the Society had given an assurance of their best endeavours to develop their plans during this period with the objective of reducing their operating deficit and operating without further Government revenue support beyond March 1986. Lord Zuckerman, in his Foreword of 1983, noted that Council had pointed out that the Society had never been commercially viable since its foundation. He made known his reservations about viability being attained by 1986 and he continued to present the Society's case as being that of a custodian of a national institution and not as that of a suppliant. In May of 1984 the Council again confirmed that, although its best endeavours might reduce its deficit, there was no possibility of achieving the desired viability. A very recent review then made by the newly appointed Chief Executive Officer had amply endorsed the validity of this assessment.

The Secretary of State for the Environment was informed of this conclusion by a memorandum presented on behalf of Council at a meeting on 16 May attended by the Treasurer and myself. The Secretary of State, in a subsequent summary of the points discussed, stated that if the Council believed that there was no possibility of getting back to viability by 31 March 1986 and that if we were now seeking permanent Government support, the Government must be so informed. We were also informed that that being so the basis of the agreement reached towards the end of 1983 would have disappeared and we would have to re-open the whole negotiation. It was arranged that a meeting would be held in July with Mr William Waldegrave, Under Secretary of State, during which the facts would be faced squarely on the basis of a series of papers to be prepared by the Chief Executive Officer in consultation with officials of the Department of the Environment.

Following the July meeting during which there had been a full exchange of views and an examination of ways in which problems of the Society might be faced, the position of the Government was recorded in a written question and answer given by the Secretary of State on 30 July, namely,

Q. To ask the Secretary of State for the Environment what representations he has received from the Zoological Society of London about their financial position and whether he will make a statement.

A. The Zoological Society of London has recently informed me that they do not believe it to be a realistic proposition that the Society could return to financial self sufficiency by 31 March 1986 as had been envisaged in the previous arrangement which I announced last December. They have therefore sought an assurance of Government support on a longer term basis.

I have reviewed the position carefully with the Society and Ministers have discussed with the Treasurer and officers plans for improving the management, marketing and presentation of their collections while maintaining the internationally recognised quality of their scientific work. The Government agree that there is a need for both short and long term support. Discussions on the form this will take are continuing, with the objective of agreeing in September a business plan drawing on the Society's operational plan. This will include defined financial and performance criteria. More detailed announcements about the level and form of support will be made at that time.

The Society submitted its Business Plan to the Department of the Environment in October. This plan included an analysis of each of the Society's activities, exploring methods of reducing costs and increasing revenue. The overall strategy for the development of the London and Whipsnade Park Zoos is the continued reduction of the number of species held but still to exhibit a representative variety in keeping with the educational and scientific aims of the Society and as part of the two Zoos' joint identity comprising the National Zoological Collection. Emphasis throughout was placed on the indivisibility of the Society's many activities by their interdependence.

Following a period for further discussion and clarification of the many points included in the Business Plan, the Government's decision was announced on 13 December by the Secretary of State for the Environment in answer to a question that had been tabled by Sir Geoffrey Finsberg. Mr Patrick Jenkin's written answer was as follows:

'The Zoological Society of London is a learned society with an international reputation in the fields of conservation and scientific research. To further these aims the society maintains the Institute of Zoology and manages the animal collections at Regent's Park and Whipsnade.

The Government support these objectives and have recognised that the society needs both short and long term assistance.

I propose to make a block revenue grant of £2 million a year, with an additional grant of £1 million in 1984–85 for the Society to pay off its overdraft. I shall make a capital grant of £1 million in 1985–86 and further capital grants thereafter of up to £$\frac{3}{4}$ million a year to match £ for £ what the Society can raise from private sources. These figures are in cash terms and will not subsequently be adjusted for inflation.

The grants will be subject to detailed conditions to be set out in a financial memorandum. The Government remain

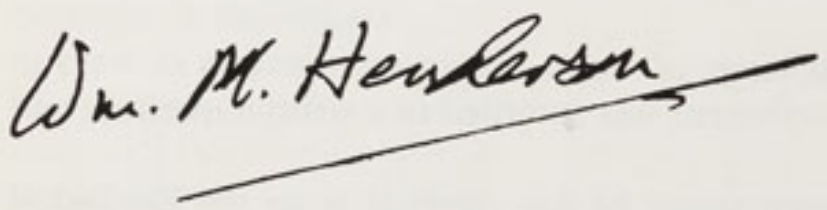
concerned that the society should use its full endeavours to contain costs and maximise income and has asked the Society to strengthen the marketing expertise available to it. The Institute of Zoology will be subject to an independent review. The Government will review the level and scope of its support after 3 years with particular regard to the progress the Society has made in implementing the Business Plan and to the extent to which they have been able to improve on the performance envisaged in it. The Government expects that there will be reductions after that in the annual call on the Exchequer.'

In concluding this Foreword, which this year it is my privilege to write, I wish to make the following points:

What is recorded above is a significant move forward in the continuous effort for the advancement and consolidation of the Society's position. What is new, and most welcome, is the acceptance by Government of the Society's need not only for short but also for long term assistance.

This new progress presents a great challenge. To gain further support from Government and from the public, we have to prove ourselves by improving our competence in management, by reinforcing our centre of excellence in research, by adding an appreciation of the animal kingdom in the education of our children, by providing a forum for the furtherance of the science of zoology, by publishing literature in support of this aim and by being leaders in the field of research, application and practice for the preservation of endangered species. A high priority is to continue the better presentation of the exhibits in the collections and the improvement of the amenities in the two Zoos for the greater interest and enjoyment of the Fellows and the public.

This year's Annual Report, providing the continuity of the record of the Society's activities, would be incomplete without the special mention of the former President which follows:



President

Professor Lord Zuckerman OM, KCB, DSc, FIBiol, FRS

Lord Zuckerman who was elected to the Council in 1953, served as Honorary Secretary from 1955 to 1977, when he succeeded His Royal Highness Prince Philip as President. It is impossible in a few paragraphs to do justice to the progress that has been made under his leadership and guidance over the last 30 years in the regeneration of the scientific work of the Society, the rebuilding of the Society's Gardens at Regent's Park and the development of Whipsnade Park. When Lord Zuckerman took office the Society's affairs were in a parlous state following the economic depression of the thirties, the disruption and damage during the war years, and the restrictions of the post war period. Apart from the buildings designed by Lubetkin, there had been no new major building for 25 years; the constitutional and administrative framework of the Society still stemmed largely from the 19th Century and the financial resources available to tackle the task of development and rebuilding were minimal.

The first few years were spent in fact finding, analysing problems and laying the ground work for future development. Many new activities were instituted including the establishment of a TV Film Unit in conjunction with Granada Television, the setting up of Zoo Restaurants Limited, the educational scheme, the series of research symposia, the re-organization of the scientific publications and the launching of the International Zoo Yearbook. Staff conditions were improved, training schemes introduced and an assured Pension Fund set up. In November 1957 an important development was the opening of the Zoo on Sunday mornings to the general public, and the re-organization of the Fellowship, which had remained unchanged since 1832. This led to a much publicised revolt by a small group of Fellows who objected to the restriction of their privileges and the emphasis which was being given to scientific development. The events of 1957, 1958 and 1959, recounted in detail in the Annual Reports for these years, were only finally resolved by a decision of the Court of Appeal in favour of the Council's interpretation of the Byelaw in dispute. The granting of a new Royal Charter followed in 1963.

The sixties and early seventies saw a major rebuilding programme in Regent's Park, based on a plan prepared by Sir Hugh Casson in 1959. Over half the London Zoo was rebuilt and over three-quarters of the mammals were re-housed. In addition to many smaller projects such as the modernization of the Library, restaurants, kiosks and other public facilities, the building of the Social Club and Educational Centre, major animal buildings were the Cotton Terraces and Snowdon Aviary (1963/1965); the Elephant and Rhino Pavilion (1965); the Clore Pavilion for Small Mammals (1967); the Sobell Pavilions for Apes and Monkeys (1972) and the New Lion Terraces (1976). With unremitting enthusiasm, energy and determination, Lord Zuckerman personally undertook the responsibility of securing the necessary financial resources, and succeeded in raising many millions of pounds towards the cost of the programme. He also secured financial support for the capital programme from HM Government and the LCC, in 1964, and again from the Government in 1970.

Lord Zuckerman's association with the Society began in 1928 when he was appointed Anatomical Research Fellow. In his autobiography he describes the small gas-lit Prosectorium and the three small rooms in the Bird House, which were then the only laboratories. Today, the Society's extensive modern veterinary facilities, pathology department, research laboratories in the Hospital (1955), the Wellcome Laboratories of Comparative Physiology (1963) and the Nuffield Laboratories of Comparative Medicine (1965) comprising the Institute of Zoology are among the foremost in any Zoo in the world. The standards of animal husbandry and veterinary medicine, and the research undertaken in comparative physiology, comparative medicine and conservation genetics are acknowledged as a unique national resource. This could not have been achieved without the personal commitment of Lord Zuckerman and his success in obtaining the support of large Foundations including, in particular, the Nuffield, Ford and Wolfson Foundations and the Wellcome Trust.

In 1970, the Council awarded to Lord Zuckerman the Society's Gold Medal in recognition of what had been achieved in the first 15 years of his Secretaryship. This is the highest honour the Society can confer and in the last 100 years has only been awarded on seven occasions. When presenting the medal to Lord Zuckerman, HRH Prince Philip said:

> 'During his tenure of office Lord Zuckerman has breathed new life into the Society. It is through his enthusiasm and planning and his positive genius for extracting money in large quantities that we have been able to achieve so much rebuilding in the Gardens and the Park and regenerate the Society's scientific work. He has had not only the vision of what should be done, but the determination to see it through despite the many, many difficulties which have been faced during the last years. At a time when so much effort was needed to find the resources to carry through the Society's rebuilding programme, to build new veterinary accommodation and facilities and to institute

a new pathology department, he has also obtained the necessary support to found two new research institutes which are now firmly established and have won national and international recognition.

I have already referred to the scientific work of the Society which owes so much to his firm belief in the basic scientific objectives of the Society and the contribution it should make to zoology and conservation and for this alone he deserves the admiration and gratitude of ourselves. '

In the last five years various factors have led to the financial problems outlined in the Presidential messages in the Annual Reports. During this time Lord Zuckerman worked tirelessly to obtain the financial support from the Government, the benefits of which efforts are now being received.

The Council warmly endorses the gratitude so well expressed 14 years ago and as a small measure of recognition of the debt the Society owes to him, this year elected Lord Zuckerman an Honorary Fellow, and established two ' Zuckerman Research Fellowships ' in the Institute which he conceived and created.

Review of the Year

Annual General Meeting

The Annual General Meeting was held on 9 May, with the President, Professor Lord Zuckerman, in the chair.

The President, Professor Lord Zuckerman, retired from office. In accordance with Article 12 of the Charter, the Treasurer, Sir Richard Way (appointed in June 1983 to fill the casual vacancy created by the resignation of Mr D. L. Donne) retired from office. In accordance with Article 10 of the Charter the following Fellows retired as Ordinary Members of the Council: Mr E. M. Behrens, The Hon. William McAlpine and the Hon. Sir Ronald Waterhouse (Ordinary Fellows); Professor W. S. Bullough and Mr W. L. Whitehouse (Scientific Fellows).

Sir William Henderson was elected President. Lord Peyton of Yeovil was elected Treasurer and the following Fellows were elected Members of Council: Lord Charteris of Amisfield, Lady Casson, Sir Terence Morrison-Scott and Sir Richard Way (Ordinary Fellows); The Earl of Cranbrook, Professor E. J. Denton and Professor Sir Richard Southwood (Scientific Fellows).

In July, in accordance with the Byelaws, the Council appointed Dr R. M. Laws as Secretary to fill the casual vacancy created by the resignation of Professor J. G. Phillips.

The President presented the following awards for contributions to zoology:

THE PRINCE PHILIP PRIZE (awarded for an account of practical work involving some aspect of animal biology, by a pupil under 19 years of age of a school in the United Kingdom) to *Miss Tracy Curds*, of St Albans Girls' School, for her essay 'An experimental ecological study of a garden compost heap'.

THE STAMFORD RAFFLES AWARD (awarded to an amateur zoologist for distinguished contributions to zoology) to *Major M. D. Gallagher*, for contributions to zoology, in particular to Arabian ornithology.

THE SCIENTIFIC MEDAL (awarded to persons under 40 years of age for distinguished work in zoology) to *Dr T. H. Clutton-Brock*, University of Cambridge, for research into the behaviour and ecology of Red deer (*Cervus elaphus*) on the Island of Rhum; and to *Professor J. P. Hearn*, Institute of Zoology, The Zoological Society of London, for work on the reproductive and developmental biology of New World primates.

THE ZOOLOGICAL SOCIETY OF LONDON FRINK MEDAL FOR BRITISH ZOOLOGISTS (awarded to zoologists for significant and original contributions to zoology in its wider implications) to *Dr G. Fryer*, Freshwater Biological Association, Ambleside, for contributions to the study of the evolution of Crustacea and of African freshwater fishes.

The President announced two further awards, which owing to the absence abroad of the recipients could not be presented at the meeting:

THE THOMAS HENRY HUXLEY AWARD (for original work submitted as a doctoral thesis) to *Dr R. R. Preston*, University of Nottingham, for his thesis 'Studies on the responses of *Paramecium tetraurelia* to amino acids'; and the SILVER MEDAL (for contributions to the understanding and appreciation of zoology) to *Professor S. J. Gould*, Museum of Comparative Zoology, Harvard University, for education of the public in the understanding and appreciation of zoology, particularly of evolutionary theory.

THE SILVER MEDAL was presented to *Professor E. H. Ashton*, University of Birmingham, in recognition of his valued sevice to the Society.

HONORARY FELLOWSHIP of the Society was conferred upon the retiring President, *Professor Lord Zuckerman*.

Amendments to the Regulations

The Resolutions to increase the annual subscriptions for Fellows and Associate Members from 1 January 1985 were agreed at a Special General Meeting of the Society held on 3 September.

The consequential amendments to the Regulations, which were passed by the Council, are given in Appendix 6.

Membership

At the end of the year there were 2,535 Fellows and 4,796 Associates.

The traditional Members' Evenings at London Zoo were changed to give one evening when formal dress was requested, two evenings for all Members and a final one which was open to the general public, entitled the 'Do in the Zoo'. The last event drew on the success of last year's Carnival evening and attracted over 4,000 visitors. Mrs Jocelyn Jones and her volunteers ran a further series of the popular luncheon lectures, and another enjoyable Carol Concert was held in December. The Members' Committee also organised an exhibition of the landscape paintings of Mrs Doreen Richardson entitled 'The Changing Year'.

The Council is grateful to the Members' Committee and to individual members for promoting the Society's well being.

Obituary

The Council records with deep regret the deaths of Professor George Gaylord Simpson, Honorary Fellow and, until 1969, Agassiz Professor of Vertebrate Paleontology, Museum of Comparative Zoology, Harvard University; Professor Erik Stensiö, Honorary Fellow and Head of the Department of Palaeozoology, Swedish Museum of Natural History 1923–1959; Senhor João de Freitas Martins, Corresponding Member who was awarded the Silver Medal in 1958 for services to the Aquarium; The Rt Hon. Lord Glenkinglas, Ordinary Fellow and former member of Council; Mr William Whitehouse, Scientific Fellow and former member of Council; The Hon. Ivor Montagu, Life Scientific Fellow and former member of Council; Dr Cecil A. Hoare, Scientific Fellow and internationally known protozoologist; H.G. The Duke of Beaufort, Life Fellow elected 1900; The Rt Hon. Lord Clitheroe, Life Fellow since 1929; Mrs Audrey Sacher, Ordinary Fellow, who organized The Zoo Carnival in 1983.

Finance

The record of the Council's negotiation with the Government during 1984 is described in the President's Introduction. On 13 December the Government announced that the Society will receive £3 million in both 1984/85 and 1985/86 and up to £2.75 million in 1986/87 when the form and level of grant will be

reviewed. A Government grant of £2.388 million was received in the year of which £888,000 relates to the Government financial year ended March 1984 and £1.5 million relates to the year ending March 1985.

The total number of visitors to both Zoos this year is almost identical to the previous year, confirming the hopes expressed last year that the decline in attendances had been halted. London Zoo recorded a very small decrease, less than 1% whilst Whipsnade increased attendances by 2.6%. The Council increased prices this summer to a level slightly higher than would have been required to match the rate of inflation, resulting in additional income of 7% at London Zoo and 15% at Whipsnade making an increase of 9% overall. This represents an inflated adjusted increase of 4% which was insufficient to offset the effects of inflation on costs and additional expenditure on major repairs and backlog maintenance at both Zoos, higher costs of fuel and water at London Zoo, together with adjustment of salaries and pensions.

Excluding consultancy income and profit from sale of investments, the operational deficit for the year is £2,032,000, an increase of £199,000 compared with the previous year.

As the Regent Self-Service Cafeteria in the Zoo was closed for renovation in the Spring, when the Society enjoyed the best attendances of the year, sales and income from Catering declined. The reopened Café in the Zoo has proved to be a much better attraction. Retail activities contributed an additional £51,900 compared with last year, making a total of £207,300 for the year.

Consultancy income from several projects has increased significantly this year, the largest project being the new Zoo at Doha, Qatar.

Donations, Grants and Gifts

Council wishes to express its thanks to all those who made contributions to the Society general funds, in particular, £500 from the Kweller Charitable Trust, and £1,000 from the Dulverton Trust towards tree planting at Whipsnade Park. Many other monetary gifts were received.

A legacy of £500 was received from the estate of E. A. Bradford-Pratt.

A final payment of £22,000 was received from the proceeds of the Zoo Carnival held in 1983. This brought the total raised to £32,064 and Council is extremely grateful to the late Mrs Audrey Sacher, the organizing and driving force of the Carnival, and to the many others who helped her.

Grants amounting to £555,600 were received to support the important work of the Institute of Zoology. A further grant of £4,000 from the British Library, was received during the year towards the cost of repairing and rebinding rare and valuable books in the Society's Library.

Again many animals were presented by members of the public and by government, local authorities and other establishments.

The Royal Botanic Gardens at Kew again supplied London Zoo with plants which were much appreciated.

Council gratefully acknowledges the help given to the Society by all those who have devoted time and money during the year to maintain the animal collections, through the Animal Sponsorship and Adoption Scheme.

The London Zoo

Visitors during the Year: 1,225,000

General

The main gate has been redesigned and greatly improved; the Cafeteria has been completely rebuilt internally as a result of generous contributions from Grandmet Compass Services and the English Tourist Board; a 'tented' covering to the new amphitheatre has been constructed thanks to the generosity of Bovis Coverspan Limited and these improvements are the beginning of a programme designed to increase the attraction for visitors. Details of these developments and other works are reported under the heading of Building Services and Grounds.

Attendances almost reached the improved figure for 1983, being only 1% lower. An excellent Easter attendance was marred by poor weather over the Spring Bank Holiday and the long hot summer encouraged people to go further afield. The new strategy for making best use of the media by aiming at increasing family visits continued during this year and television advertising was used at peak periods.

To support the advertising campaign special events were organized, the major event being the Apes and Monkeys Exhibition opened in June by the TV stars David Bellamy and John Craven. Written and co-ordinated by the Society's Design and Information Unit, the exhibition used colourful graphics, cut-outs and hands-on devices to give better information about the animals, and Zoo volunteers helped in the exhibition by manning Touch Trolleys. Later in the year, the Red Squirrel Watch, sponsored by the National Provident Institution, and the Um Bongo Gorilla Day, organized by Libby McNeill & Libby Ltd, provided very enjoyable events which interested and involved visitors.

The Animal Adoption Scheme continued to attract favourable publicity throughout the year in a wide section of the media and the income it provides for the two Zoos is now almost £80,000 from more than 2,000 generous adopters.

The Society is grateful to the Variety Club of Great Britain for arranging for Mrs Nancy Reagan to visit London Zoo in June and the Society was pleased to welcome her and the party of children from a nearby nursery school. Mrs Reagan was introduced to some of the Zoo's animal personalities, including a young Reindeer whom Mrs Reagan graciously agreed to let be named 'Nancy' in her honour.

The Society daily receives requests for information and assistance from a wide national and international range of sources. More major consultant services have recently been requested for the design, management and stocking of new zoos being planned in Qatar, Sharjah and Bahrain. The initial contract with the Doha Municipality, Qatar, was successfully concluded with the opening of the new Doha Zoological Gardens in February. No fewer than 800 animals were despatched from Marwell and the Society's collections and nine members of the Society's staff were engaged in the contract.

The Collection

Mammals

The larger primates kept in the Sobell Pavilions were highlighted by the summer promotion on Apes and Monkeys. There were babies in 10 of the 13 groups, with births in the newly re-established Mandrill, Diana Monkey, and Chimpanzee groups being particularly noteworthy. The ape enclosures were re-covered with heavy gauge mesh during the spring, giving greater flexibility in ape management. The male Gorilla at London was exchanged with the one at Chessington Zoo to improve the breeding chances of animals which had previously been housed with companions with whom they had been reared. A female Gorilla from Jersey Zoo visited for mating, as did two female Orang Utans, from Twycross and from Chessington. During the year young were born to Orang Utans at Blackpool and Chester which had been mated in London last year under the co-operative ape breeding scheme of the UK Anthropoid Ape Advisory Panel.

The Cotton Terraces had one of the most successful years on record for the breeding of rare ungulates. The baby female Okapi was the first of this species to be born at London Zoo, as were the baby Addax and Bongo. All were reared successfully. The sex ratios were favourable, the Okapi and Bongo calves being female, as were the Giraffe, Brazilian Tapir, and Bactrian Camel offspring. Eleven of the 18 births among the Greater Kudu, Roan Antelope and Blackbuck herds were also female. A male Vicuna was imported to pair with the female calf born here last year. Two young animals very amenable to handling, were the new Alpaca, and the Przewalski Horse colt which was born to a domestic pony mare following its transfer as an embryo from one of our Przewalski Horse mares.

Two Californian Sealion pups were born. The first was to an experienced female who had not bred for five years. She reared her pup well, being given access to it at night only and to the bull and other members of the adult group by day. The second was born to a female who had lost her previous two pups and so it was decided to remove this youngster at birth and hand rear it.

Hand rearing of young animals requires considerable skill and devotion by the keepers responsible. It was achieved successfully with a number of other species this year, including a Ruffed Lemur, a Red-necked Wallaby, a Sooty Mangabey, a White-faced Saki Monkey, a Common Marmoset, a Bactrian Camel, an Addax, a Blackbuck and a Greater Kudu.

Amongst the large carnivores born and reared were a Leopard and two Jaguars. The Wolf pack, set up two years ago by adding two female puppies to the two adult males, started breeding this year, with both bitches producing a litter. The female Giant Panda 'Ching Ching' again failed to come into season, and sadly there is now probably little likelihood that she will ever breed. Another disappointment was the stillbirth of two Polar Bear cubs.

Animals in The Clore Pavilion for Small Mammals again produced a large number of babies. Among them were six Beavers (after litters of five in each of the two previous years), two Oriental Small-clawed Otters, many Arabian Jerboas and a Philippine Cloud Rat, both for the first time in Britain, 15 other species of rodents, three Grey Mouse Lemurs, 13 of five species of Marmosets and Tamarins, and 10 Tree Shrews.

Among the new species acquired were a big group of Seba's Short-tailed Bats, and smaller groups of Chamois, Spider Monkeys, Four-eyed Opossoms and Ground Cuscus. The quarantine space was also used for imported Golden Lion Tamarins, a Brazilian Tree Porcupine, and both Slender and Slow Loris. The Society stopped keeping Timor Deer and Reeves's Muntjac at London, sending them to San Diego and Blackpool respectively.

As usual, there was a great deal of co-operation with other major zoos in moving animals around to improve their breeding.

Such moves of larger mammals included Gaur to Howletts, Orang Utan and Addax to Aalborg, Blackbuck and Black Rhino to Chester, Leopard to Cricket St Thomas, Okapi to Bristol, Roan Antelope and Hartmann's Mountain Zebra to Marwell, and Kulan to Colwyn Bay.

Although most of the mammals are kept confined, one species was released. Ten young Red Squirrels, trapped in Fife where they are so numerous as to cause damage, were habituated to life in the Zoo and then allowed free. The animals are radio-collared, and are monitored daily. So far the reintroduced squirrels are establishing themselves very encouragingly.

A record total of 203,820 animal rides, representing about 1/6th of our visitor numbers, were given during the year.

Birds

The number of species and individuals bred was approximately the same as in the previous year. The majority of birds in the collection are now captive-bred, being either hatched here or in other collections. Almost all of those species which breed in colonies are in groups which are entirely or mainly composed of captive-bred individuals. For example, the colony of Black-footed Penguins now numbers 19, and of these 13 have been bred here, including four hand-reared this year. All of the Abdim's Stork group of 20 birds were captive-bred, 14 of these at London including four parent-reared birds of this year. The Chilean Flamingo colony on the Three Island Pond is now composed of 41 birds of which at least 20 are captive-bred, and of these 18 were bred here including five this year. The entire group of eight Ruffs (four male, four female) were bred here, and now includes a 1984 hand-reared female.

A success of particular interest was the hand-rearing of a Bateleur Eagle. The egg was laid on 7 January, on a cold day, and by 20 January, because of the nervousness of the female and the weather conditions, it was decided to take the egg away to the safety of an incubator. On 2 March after a total incubation of 55 days, a chick hatched, though only after assistance from the keepers. A few days before hatching it had been noted that the chick was in an abnormal position and without help it would not have been able to break out of the shell. Over several hours pieces of shell were carefully and slowly removed, and finally the chick was lifted out. On the following day it weighed 106 gm and was given its first meal of pieces of mouse. The chick grew slowly, but fed well and now as a fully fledged youngster weighs over 2 kilogrammes.

Other noteworthy breeding successes included the artificial incubation and the hand-rearing of a Stone Curlew (parents captive-bred and presented in 1982), four Crowned Cranes, 13 species of galliform, including a Vulturine Guineafowl, Bamboo Partridge, Koklass, Scintillating Copper, Blue Eared, Grey Peacock and Bronze-tailed Peacock Pheasants, and six species of waterfowl including Brent Geese and Hawaiian Geese. Parent reared birds included an Oystercatcher, three of the rarely bred Ruppell's Parrot, five Rock Peplar Parrots and six species of owl, including for the first time in this collection and very rarely elsewhere, the White-faced Scops Owl.

Species brought into the collection included four pairs of captive-bred Avocets, two pairs of Congo Peafowl on breeding loan from Antwerp Zoo, a pair of White Woodpeckers from Wassenaar Zoo, three captive-bred Stone Curlews presented by Philip Wayre of the Norfolk Wildlife Park, and an African Wood Owl on breeding loan from Jersey Zoo, two Inca Terns, a pair of Red-billed Toucans, and a pair of Bronze-tailed Peacock Pheasants.

Reptiles

Seventeen species totalling 278 individuals were bred during the year. Of particular interest was the first time breeding, both in this collection and in the United Kingdom, of the Fat-tailed Gecko, Carpet Python and Innes' Cobra.

Interesting species acquired included, for the first time in this collection and in the United Kingdom, Taipans from Melbourne Zoo; Gila Monsters from the Arizona Sonora Desert Museum; McMohan's Desert Vipers; Fierce Papuan Boas, and Blue-ring Boas.

One of the laboratory rooms which is used as an incubation area has been redecorated and a small air-conditioning unit installed. Ultra-violet germicidal lamps are used to sterilize the room and all items and materials used for incubation. The modification helped to overcome the fluctuating temperatures and the moulds that often appear on eggs. It has certainly contributed to the increased number of successful hatchings.

The Giant Tortoises have not been on exhibition for some time while work is in progress installing underfloor heating in their enclosure in the reptile house.

A number of cages have been completely redecorated using both live and artificial plants.

Aquarium

The marine section saw some major changes during the year. The big turtle tank was disbanded, since it was felt that it did not provide sufficient space for the large turtles housed there. A good home at Blackpool Aquarium was found for the four animals, which had been at London for between four and 30 years. The tank was re-fitted with a new filtration system for use as a large tropical marine exhibit.

Two Giant Moray Eels, from the Caribbean were obtained. Although they were only 18 inches long on arrival, they should grow to about 3 metres. Leopard Sharks from California, a small Eagle Ray, and a group of nine Horseshoe Crabs were among the more exotic marine species obtained. With the help of the MAFF Laboratory at Lowestoft and the Blackpool Aquarium we received a supply of local marine fish. Three Octopus which had been used for filming purposes, were obtained from the BBC.

Some small Arapaima were obtained for the Tropical fresh-water section. They have grown fast since their arrival, and now make a fine group in the large corner pool. International legislation controls the large trade in the East of this threatened species of fish.

Improvements to the heating and insulation systems have resulted in better control of temperatures than has been possible in recent years.

Three more small Paddlefish were obtained for the Fresh-water section, and make a striking exhibit seen on first entering the Aquarium.

Two Chinese Mitten Crabs, probably introduced accidentally from overseas, were presented after being found wandering in the suburbs of London.

Insect House

An observation bee hive, and honey-making display, were set up at the entrance of the Insect House. The bees have been a very popular exhibit. They swarmed once but were re-captured.

The production of insects for food for other animals in the Zoo has been modified so as to be less labour-intensive. Large new cultures of African Bush Crickets and of Giant Mealworms have started to be very productive. The breeding of locusts meanwhile has continued, experimenting with a variety of different methods and four different species.

As usual, most of the species kept and displayed were successfully bred, and animals provided to many other organisations. Amongst the more unusual animals bred were the Desert Scorpion, *Lierus quinquestriatus*, and the Desert Locust, *Acanthacris ruficornis*, both first successes for London.

Buildings, Services and Grounds

1984 saw more activity than for many years; the outstanding development was the modernization of the cafeteria in the Regent Building, now known as 'The Café in the Zoo'. Providing fast free-flow service with seating in smart and relaxing surroundings, the £465,000 construction and furnishing contract was completed in June after a short nine month planning and building period.

Early in the year the Society accepted the generous offer by Bovis Coverspan Ltd to cover the old 'Chimp Tea Party' lawn and terrace with a tensile tent structure. In this, the 'Hummingbird Amphitheatre' London Zoo can claim yet another outstanding structure to enhance its reputation as a patron of fine innovative architecture and engineering, while adding to facilities and attractions for visitors.

A more modest, but necessary, improvement has been at the Zoo Entrance. An experimental new layout was designed by the Architects Department with the Public Services Department, and implemented in time for the summer season; the inside terrace is now 'outside' the Zoo boundary, forming a pleasant and welcoming area in which visitors can gather and pay.

Other works appreciated by visitors are a more attractive timber fence around the much-photographed Giraffe enclosure, and the removal of coin locks from the lavatories, making them all free, a considerable task involving some 85 cubicle doors.

Lack of resources again restricted maintenance to the most urgent items, so that generally the buildings and equipment continued to deteriorate. Surveyors were commissioned to make an external examination of all roofs in the Zoo during the conveniently wet month of February. They reported that the majority had defects of some kind, many leak, and that quite a number are beyond repair.

Extensive work has continued in the essential replacement and improvement of heating installations. The Aquarium boilers had to be renewed completely, new burners fitted to the Nuffield Building boilers, and the heating and air-conditioning ducting in the Clore Pavilion was thoroughly cleaned. Throughout the Zoo asbestos insulation is replaced as the opportunity, or need, arises. Particular attention is being given to achieving fuel economy, and, as a first step, automatic controls have been fitted to the Main Boiler Plant, which should result in substantial savings.

The Architects Department prepared new Development Plans for both London Zoo and Whipsnade Park Zoo, in consultation with other Departments, the Gardens and Park Committee, and the Society's Consultants. These Plans were included with the Business Plan submitted to the Government, as forming the basis for the continuing reconstruction and modernization of both Zoos over the next 15 years.

In order to increase the attraction of the Zoo for visitors the main effort of the Gardening Department concentrated more on public areas. Therefore, the glass-houses have been re-organized to propagate only sufficient half-hardy plants to meet the needs of the year ahead, while tropical and other plants will be bought in. Following the alterations to the Zoo Entrance, colourful temporary planting was installed so as to give a bright first impression. New planting was also carried out to a tight schedule in front of 'The Café in the Zoo' and around 'The Hummingbird Amphitheatre'.

While the ape enclosures in the Michael Sobell Pavilions were having mesh replaced, the opportunity was taken to renovate the landscaping with the assistance of a contractor. In October the Department commenced work on renovating the Lion and Leopard enclosures in the New Lion Terraces in which the planting had suffered most from the wear and tear of large cats living there for the last eight years. Extensive use has been made of timber posts to protect the new plants from these heavy and active animals until they are established. Additional tree trunks, from Whipsnade, have also been installed to provide climbing and scratching features to distract the cats.

Whipsnade Park

Visitors during the year: 385,000
Cars brought into the Park: 47,200

General

Despite the general downward trend in attendances at zoos in the British Isles, Whipsnade finished the year up by 2.6% on 1983—the best year since 1981—the year of the Fiftieth Anniversary. The increase in attendances took place mainly in February when attendances were 6,000 up and April when they were 33,000 up, but the figures for the months of June, August and October were significantly lower than for last year. The number of cars entering the Park continued to increase in relation to the total number of visitors.

Sponsored walks again took place in the Park with excellent financial results for both the Cancer Research Association and the World Wildlife Fund.

No major development was carried out during the year but the improvements in the layout and facilities of the Children's Zoo continued. Three play areas for younger children have been developed. A 'Safari Lookout' tower and slide with wooden wild animals, a 'tots' farm and animals, and the 'Umfolozi Halt' with a tubular framed steam engine and wagon.

Major maintenance work included the annual programme of road surface repairs and fence renewals, both to the 10 kilometre boundary fence and to the internal paddock fences. The 3 metre high boundary fence is a very costly item to maintain and repair but without it, predation by foxes would seriously affect the successful maintenance of the bird collection and some of the smaller free living mammals which at present roam over the whole Park. Essential repairs to the brickwork of staff houses and the Chimpanzee house were carried out.

Permission was sought and obtained to re-open the borehole which supplied water to the Park from its opening until the late 1950's when supplies were obtained via the local Water Board mains.

The Collection

The total list of births and hatchings is recorded in Appendix 4.

Two outstanding breeding successes occurred during the year. The birth of three more litters of Cheetah brings the total number of young born since the programme began in September 1967 to 106. This consists of 31 litters of which 20 were from parents born in captivity and three where their grandparents were also captive bred. The sex ratio of the cubs is still in favour of females. A total of seven males and eight females have bred. In addition to the original pair imported from East Africa and Zimbabwe, a male born in Montpellier Zoo, a male born in Howletts Zoo and a female born at the De Wildt breeding station of the National Zoo in Pretoria have contributed. The number of animals born, the continuity of the programme over 17 years and the fact that third generation young are now being produced makes this a very important event in the history of the captive breeding of an endangered species. The offspring have been distributed to other collections throughout the world.

The other success, for the first time in the Society, was the birth of a female Bottle-nosed Dolphin. Staff commenced a 24 hour watch on the mother and baby immediately after birth and cautious optimism was felt when the youngster passed the first critical period of 14 days. Despite a number of apparently minor bumps against the sides of the pool during the first two days after birth, she progressed well. At the end of her third week a few small abscesses developed on her tail. A week later she suddenly died after a violent thunderstorm. An immediate post mortem examination was carried out and suggested that the storm may have been a final stressing factor superimposed on an infection which had come from the self inflicted damage to the 'beak' in the first few hours of life and the abscesses on her tail. Tragically, and despite intensive treatment, the mother died 27 days later with an infection of the middle ear and pharynx. The bacteria isolated were different from those found in her baby and the two causes of death were thought to be unrelated.

Notable births occurred in the Chimpanzee Colony and amongst the Siberian Tigers, Przewalski's Horse, European Bison, Musk Oxen, Swamp Deer, White Rhinoceros and Thomson's Gazelles. The herd of Pere David's Deer produced over 20 calves of which the females were hand-reared to enable Institute of Zoology staff to carry out a programme of study on the reproductive biology of the species.

Amongst the birds a King Parrot was hatched for the first time at Whipsnade Park, and another King Penguin was reared. Twenty-one Humboldt's Penguins, five Rosy Flamingos and seven cranes (Red-crowned, White-naped and Wattled) were hatched. Two male Red-crowned Cranes were exchanged with two from the Vogelpark Walsrode after the studbook keeper had suggested a change of breeding stock.

A number of the young cranes of rare species kept in the Park were distributed amongst other members of the Joint Management of Species Group in the British Isles to ensure their being retained within the UK quarantine zone and to relieve the heavily populated facilities at Whipsnade.

Scientific and Educational Activities

Scientific Meetings

Eight scientific meetings were held in 1984. The February meeting, the eighth in the series 'The Scientific Basis of Wild Animal Husbandry', on the subject of birds, included papers by Dr H. J. Samour on 'The use of fibre optic endoscopy for sex determination in monomorphic bird species' and by Dr Janet Kear on 'Causes of mortality of ducks and geese in captivity', and a film 'Shelduck'. In March Professor P. S. Corbet spoke on 'Territorial behaviour in dragonflies', Dr R. C. Brace on 'Dynamics of individual spacing in the anemone, *Actinia equina* (L.): the interplay between behavioural and reproductive strategies', and Dr G. F. Warner on 'The cracking of winkle shells by crabs: contrasting behaviour in *Carcinus* and *Liocarcinus*'. At the April meeting, papers by Dr T. R. Birkhead, on 'Mate guarding in birds', and Mr D. G. C. Harper, on 'Why do robins not mate guard?', were followed by a film, 'The Commendable Crow'. Three papers were given at the May meeting: by Professor R. M. Anderson, on 'Population dynamics and parasites: theory to practical control', Dr A. E. Keymer, on 'Parasite ecology: the experimental approach', and Professor D. Wakelin, on 'Genetic and immunological factors that may influence distribution of parasites in host populations'. In June Mrs C. Lockyer spoke on 'Estimating the energy costs of the reproductive cycles of the north east Atlantic Fin and Sei whales', Dr M. Klinowska on 'The behaviour of dolphins', and Mr V. J. A. Manton on 'Reasons for keeping dolphins in captivity'. The autumn session opened in October with a meeting on the functions and evolution of bird song, at which the speakers were Dr C. K. Catchpole, on 'Sexual selection and the evolution of bird song', Professor P. J. B. Slater on 'Bird song learning and cultural evolution', and Dr P. K. McGregor on 'The unsung songs of Great tits'. In November Dr P. H. Greenwood spoke on his work with Dr K. F. Liem on 'Aspiratory respiration in *Arapaima gigas* (Teleostei: Osteoglossomorpha): a reappraisal', and introduced the film 'The Mouthbreeders' which followed Professor P. J. Butler's paper 'Breath-hold diving: a bird's eye view'. At the final meeting of the year, in December, Professor W. D. Hamilton spoke on 'Sex and mate choice for the defeat of parasites', and was followed by Professor P. P. G. Bateson on 'The balance between inbreeding and outbreeding' and Dr T. R. Halliday on 'Choice and competition in the evolution of sexual behaviour'. The Society warmly thanks all the speakers who took part in a very successful programme of meetings in 1984.

Symposia

Two Symposia were held in 1984:

31 May and 1 June: 'Advances in animal conservation', opened by HRH The Prince Philip, Duke of Edinburgh and organized by Professor J. P. Hearn, to celebrate the 80th birthday of Professor Lord Zuckerman.

23 and 24 November: 'The ecology of bank voles and wood mice', held jointly with The Mammal Society, and organized by Dr J. R. Flowerdew, Dr J. H. W. Gipps and Dr J. Gurnell.

Publications

The arrangements for the production of the *Journal of Zoology*, *Transactions* and *Symposia* were reviewed; from January 1985 these journals will be printed and distributed for the Society by Oxford University Press.

The *Journal* will be published as Series A and Series B. Series A will appear monthly as at present; Series B will incorporate the *Transactions* and will be published as suitable papers occur.

Journal of Zoology Volumes 202, 203 and 204 were published, and together contain 103 papers. The work of the many referees who give their time to help in the assessment of the very large number of papers submitted for publication is gratefully acknowledged by Council.

Transactions Two parts were published: Volume 37, Part 1, 'The courtship, aggression and mating system of a "primitive" fiddler crab (*Uca vocans*: Ocypodidae)', by Michael Salmon; and Volume 37, Part 2, 'Hydrodynamics of suction feeding in fish', by M. Muller and J. W. M. Osse, 'Optimum sucking techniques for predatory fish' by J. L. van Leeuwen and M. Muller, and 'A quantitative study of flow in prey capture by Rainbow trout, *Salmo gairdneri*, with general consideration of the actinopterygian feeding mechanism' by J. L. van Leeuwen.

Symposia Three volumes were published: No. 51, 'Physiological strategies in lactation', edited by Professor M. Peaker, Dr R. G. Vernon and Dr C. H. Knight; No. 52, 'The structure, development and evolution of reptiles', edited by Professor M. W. J. Ferguson; and No. 53, 'The biology of terrestrial isopods', edited by Dr S. L. Sutton and Dr D. M. Holdich.

Zoological Record Volume 118 (1981 literature) was completed in November and the first sections of Volume 119 (1982 literature) were issued in December. Volume 120 (1983 literature) is in the course of production and will be completed in 1985; it is expected to contain references and index entries for about 76,000 published items.

The Zoological Record Advisory Committee met in Philadelphia in October to review progress and discuss future developments. Earlier in the year some members attended the dedication ceremony for Garforth House, the Georgian House in York acquired by BIOSIS to house the *Zoological Record* staff.

The Council is most grateful to the Director General of the Lending Division, British Library, for access to the library at Boston Spa, and to the Trustees, Director and staff of the British Museum (Natural History) for accommodation and the use of the libraries.

International Zoo Yearbook

Volumes 24 and 25 of the *International Zoo Yearbook* are to be published in 1985 as a single volume which will be somewhat longer than usual.

The Proceedings of the Fourth International Conference on Breeding Endangered Species in Captivity, held at Rotterdam, Netherlands, in September 1984, are being published in Section 1. Included are a number of valuable review papers which give comprehensive accounts of recent achievements in animal conservation and management, as well as indicating the kinds of problems which have yet to be overcome. The section also contains a number of important papers on genetic management of rare or endangered species, new discoveries in artificial breeding techniques, and the continuing development of programmes for captive breeding. The range of species discussed is particularly broad, and mention is even made of rare plants in zoological collections.

Section 2 covers 'New developments in the zoo world' and contains articles on research into the breeding and husbandry of endangered reptiles, birds and mammals or of species which are difficult to maintain in captivity. Further articles cover the hand-rearing and subsequent reintegration of young to their natal groups, and the construction of new buildings and exhibits.

The third section contains not only an updated list of zoos and aquaria of the world but also data for two years in the list of vertebrates bred in captivity and in the census of rare animals in captivity. The breeding lists cover the years 1982 and 1983, and the census is taken on 1 January in each of the years 1983 and 1984. A list of studbooks and world registers for rare or endangered species in captivity, giving information for 1982 and 1983, is also included.

The Library

During 1984 the Library has continued to supply a full Library service to the membership of the Society, to its staff and to the staff of the Institute of Zoology. In addition, the Library is used by an increasing number of Library Ticket Holders, of which this year there were 122 and a number of scientists also came from overseas to work in the Library. Altogether there has been a particularly marked increase in the use of the Library.

The year under review was the last full year of the British Library annual grant of £4,000 which has made possible a most impressive improvement in the condition of the unique collection of older and illustrated works in the Library. The Society is grateful to the British Library for its generosity over the past five years.

The great strength of the Library is its magnificent collection of serial publications. This has continued to grow over the year, but the Society's financial problems, aggravated by a considerable fall in the value of the pound compared with other currencies, particularly the dollar, have made it necessary to discontinue a number of titles, in fact a total of 35 over the past few years, and, unhappily, further cuts are anticipated. Fortunately, fewer than 250 of the 1,500 titles on our current list of journals are now purchased. Most of the others are received in exchange for our own publications.

We are particularly grateful to those who have generously donated books to the Library, among them His Majesty Emperor Hirohito of Japan KG, Mr A. Baker, Miss B. Chinneck-Scoble, Professor J. L. Cloudsley-Thompson, Dr A. Desmond, Mr J. Edwards, Professor J. Hearn, Miss A. Howe, Mr H. Kirk, Mrs S. Lackner, Mr F. Lane, Dr R. Laws, Mrs M. Lewis, Mr H. Moore, Professor G. Pilleri, Miss S. Saklatvala, Dr R. Spearman, Mr B. Taylor, Mr M. Tweedie, Professor A. Van Tienhoven, Mr G. Wood, Mr S. Worby and the Centre de Recherches Ornithologiques de Provence.

Education Department

Programme for Schools

The secondment of Mr Michael Down by the Inner London Education Authority to the Society's Education Department continued but there were no other secondments during the year and, as a result, the number of teaching staff available was smaller than it was in 1982 and 1983. This, and the industrial action by teachers employed by local authorities, affected the number of booked visits during the Summer Term, and the

	London Zoo			Whipsnade	Total
	Spring Term	Summer Term	Autumn Term	Summer Term	
Primary school pupils taught by volunteers	2,619	5,272	1,067	0	8,958
Other primary school pupils	558	8,149	1,570	884	11,161
Less academic secondary school pupils	366	367	516	0	1,249
11–13 year olds	9,813	4,396	8,693	1,834	24,736
14–16 year olds	5,397	163	2,549	621	8,730
GCE 'A' level pupils	3,724	118	2,220	0	6,062
Students from universities, polytechnics, etc.	505	204	519	0	1,228
Total	22,982	18,669	17,134	3,339	62,124

numbers of pupils taught were lower than the record total achieved in 1983.

New volunteers to conduct tours of the London Zoo for primary school pupils were recruited and trained in the Spring. As a result a total of 70 volunteers was available during the Summer Term. Two new tape slide presentations for 11 to 13 year old pupils were introduced during the Autumn Term. One, on *Classification,* was produced in association with Harrow Technical College, and the other on *Fish* was produced by Mr Michael Down. A special open evening was held to introduce these productions to teachers from the London area.

During the year special lectures and demonstrations were organized for Chelsea College, Chelsea School of Art, Derby Lonsdale College, Digby Stuart College, Harlow College, Hatfield Polytechnic, Havering Technical College, King's College, London, the London School of Chiropody, Loughton College of Further Education, Middlesex Polytechnic, North-East London Polytechnic, Oxford University, Paddington Technical College, Queen Mary College, Rose Bruford College of Dramatic Art, the Royal Veterinary College, South London Technical College, Westfield College, London, West Kent College, Wolverhampton Polytechnic, and University of London Extra-Mural Department.

The numbers taught by volunteers and Education Department staff during the year are set out in the following table on the previous page.

Other Courses and Events

A two-day course on the educational use of zoos was organized at the beginning of the Summer Term for teachers employed by the Essex local Education Authority, and another one-day course was organized during the Autumn Term for teachers in schools for the children of American servicemen in the United Kingdom. During the Spring Term the first course for the half-course unit in animal diversity and adaptation for a University of London BSc Zoology degree was completed. This course, conducted jointly by the staff of the Society's Education Department, the British Museum (Natural History) and University College, met with general approval. A second course on the subject, attended by 26 students of University College, London, began in the autumn.

In December Dr Malcolm Coe and Professor Sir Richard Southwood took the chair at a Sixth Form Symposium entitled *Animals and Plants: Cooperation and Conflict,* organized jointly with the Zoology Department of the University of Oxford. Three meetings for the children and young friends of members of the Society were organized during the Christmas holiday period. They were an *At Home,* at which some of the Zoo's animals were the stars, *The Way of the Dolphin,* an illustrated talk by Mr Victor Manton, and *Bats and Conservation,* an illustrated talk by Mr Andrew Watson and Dr Tony Hutson.

Young Zoologists' Club

Three issues of Zoo Magazine were produced during the year. Meetings for Club members were held during the school holidays, and included a photographic safari at the London Zoo, *Zoo Quests* at both the London Zoo and Whipsnade, and visits to the Cotswold Wildlife Park, Kilverstone Park, Twycross Zoo, and the Royal Society for the Protection of Birds Headquarters at Sandy.

Volunteer Activities at the London Zoo

In the spring 72 additional volunteers were recruited and trained to work with the public at the London Zoo during the summer season. They ran the Information Bureau, selling *Zoo Guides* and season tickets, gave short talks, and ran the Brass Rubbing Centre, thereby contributing to the funds of both the Society and the World Wildlife Fund. At the Art Cart young visitors were encouraged to draw the animals. At other locations bones, skins and other handling materials related to reptiles, ungulates, big cats and primates were demonstrated to enthusiastic visitors.

Research

INSTITUTE OF ZOOLOGY

The Institute of Zoology carries out basic research in zoology and animal physiology, applying the results to problems in conservation and comparative medicine. A full account of the research, University lecturing and collaborative work carried out by the Society's staff is published in the Scientific Report (1982–1983), which is available on request. About half of the costs of the research staff and projects are covered by grants from the Research Councils and 30 other agencies. The remaining costs are met by the Society to support the veterinary staff in the care and welfare of the animals, and the work of the scientific staff which is essential for, and directly applicable to the management and breeding of animals in captivity and in the wild. Much of the Institute's work relies on the close collaboration and support of the Society's keeper staff.

The Institute was reorganized during 1984, abandoning a system of seven departments in favour of four research groups each composed of four research units. The new system allows greater flexibility in pursuing research projects, raising grants and in sharing resources.

Elf Aquitaine UK plc donated a new scanning and transmission electron microscope to the Institute for studies of gamete and embryo development. This generous gift will help in research aimed at improving the breeding and conservation of rare animals.

Many staff of the Institute spent brief periods abroad working in research and training projects in conjunction with the World Wildlife Fund, the World Health Organization, the Overseas Development Administration and the British Council.

Veterinary Science

London Zoo

In 1984, 522 animals from the Collection were clinically examined either in their houses or in the Animal Hospital. A further 271 patients were referred from private practice. 736 post mortem examinations were performed, including 45 external cases.

During the year the animals remained in good health. Extensive clinical surveys were carried out in the Clore Pavilions and the Reptile House. These, together with improvements in management, have led to increased breeding success.

Mr J. A. Knight visited China for two and a half months in the spring and autumn in a collaborative project, with the World Wildlife Fund and the Chinese Government, to assist with the management and veterinary care of the Giant Panda. The visit provided an excellent opportunity to take technology developed in the Institute out to the field. This work, together with field projects already under way, will assist in a management programme for the future survival of this species.

Whipsnade Park

In 1984, 469 animals from the Collection were examined clinically and 345 post-mortem examinations were carried out.

Research into vitamin E requirements was extended to Equids after a few losses believed to be associated with a deficiency of this vitamin. A study of vitamin A requirements in Polar Bears was completed. New projects were started, including investigations aimed at preventing lameness in neonatal Père David's Deer and foot lesions in Flamingos; the use of gaseous anaesthesia in the field; nutrition of the Red Panda; and a chronic wasting disease, probably viral in origin, affecting a number of ungulates.

Haematology

Dr Christine Hawkey and her staff established baseline haematological values for Penguins, Oryx, Deer and Cheetah, and commenced work on a colour atlas of veterinary haematology. Dr S. Omorphos began a study of the shape and membrane structure of red blood cells in normal Camels, Deer and in Common Marmosets. The work will provide normal values for these species that will help in the diagnosis of illness. In order to improve methods of sedation and aneasthesia in wild ungulates, Dr P. Pearce developed techniques for monitoring cardiovascular and respiratory functions during immobilization. Investigations of the effects of etorphine and xylazine in Scimitar-horned Oryx and Black Fallow Deer contributed towards clarification of the problems of respiratory depression, cardiac arrhythmia and hypothermia that are often encountered during sedation of ungulates.

Computing

The facilities for computing were strengthened during the year for a number of important projects. Mr G. Moore developed computer programmes for a diagnostic veterinary service for zoos, incorporating the Society's data base in haematology, blood biochemistry, clinical treatment and pathology. The data are being assembled by Dr Hawkey and Mr S. Pugsley. Programmes for the optimal future management and breeding of Great Apes in Britain were completed by Dr Georgina Mace, Conservation Co-ordinator of the National Federation of Zoological Gardens of Great Britain and Ireland. Dr D. Abbott established a programme for real-time sequential analysis of social and reproductive behaviour, in order to improve the captive environment and conditions for breeding in primates. London and Whipsnade Zoo animal records will start to be computerized over the next year. Computer links are being established with relevant centres in the USA and Europe to help in international breeding programmes of rare species.

Comparative Physiology

Developmental Biology

Research on embryo storage and transfer carried out by Dr P. Summers resulted in the first birth of a Przewalski foal that had been transferred to a domestic pony as a blastocyst one week after fertilisation. This success provides a new way of accelerating the breeding of rare Equids. Dr Summers also achieved considerable success in freezing and thawing embryos from Marmoset monkeys. A number of healthy babies were born showing that the freezing process has no harmful effects in this primate.

Dr Philippa Saunders commenced work on the early secretions of Marmoset embryos around the time of implantation, with a view to developing new early pregnancy tests in primates and to understanding the causes of early embryonic loss. Professor J. Hearn completed a study of the role of chorionic gonadotrophin during implantation in primates and extended the work to examine possible signals between embryo and mother during the first week of pregnancy.

Gamete Biology

A library of monoclonal antibodies to sperm surface proteins

was developed by Dr H. Moore, as probes to study mammalian spermatogenesis and sperm maturation. Two antibodies of particular note were produced, one of which is an excellent marker of the sperm acrosome reaction in the human and may provide an indicator of sperm fertilizing capacity. The other antibody recognizes a particular stage of germ cell development. The exact stage of sperm development when these proteins are expressed was determined by Dr Caroline Smith using immunocytochemical techniques in conjunction with the new electron microscope.

A rapid system for the computerized assessment of sperm fertilizing capacity was developed by Dr W. Holt and Dr Moore. The results show that the fertility of human and animal spermatozoa can be assessed accurately *in vitro*. The system is being applied to the treatment of infertile animals and men; and to the assessment of the potential viability of sperm after freezing and storing.

Dr Holt completed a trial of artificial insemination in Blackbuck, resulting in successful births in six of nine attempts. A further trial using frozen semen is under way. Biochemical and ultrastructural studies of the cause of sperm damage during cooling, freezing and thawing are in progress.

A colony of Short Gray-tailed Opossums was established for studies in developmental and gamete biology. Methods for inducing oestrus in these animals were discovered and pre-implantation embryos were recovered and cultured.

Hormones and Behaviour

Studies of the control of ovarian function during the oestrous or menstrual cycle and early pregnancy were carried out in primates, ungulates and the Giant Panda. Dr J. Hodges developed simpler methods for detecting ovulation and pregnancy based on direct immunoassay of urinary steroid conjugates. New methods of treating infertility, using subcutaneous mini-osmotic pumps to deliver small doses of luteinising hormone releasing hormone (LHRH), were assessed in primates and in the Giant Panda. The approach holds promise as a practical method for inducing ovulation and enhancing fertility in endangered species. A study was begun of the effective dose range of LHRH in the Giant Panda, in order to improve the prospects for captive breeding.

Dr D. Abbott began a study of the natural suppression of fertility in mammals. He showed that dominant female Marmosets prevent ovulation in subordinate females by means of a block at the hypothalamic level; the behavioural, pheromonal and physiological causes are now being investigated. Similar studies were initiated to examine the natural control of fertility in Naked Mole Rats.

Reproductive Ecology

Dr A. Loudon and Dr J. Curlewis examined the factors regulating embryonic diapause in Bennett's Wallabies and successfully induced embryonic activation with melatonin. Studies of reproduction of Axis and Père David's Deer at Whipsnade were undertaken by Drs Loudon and Curlewis, and Mr R. Kock. Work on Axis Deer showed that although this sub-tropical species was not a seasonal breeder, males underwent spontaneous long-term cycles of testicular regression and development. Studies on the Père David's Deer concentrated on the factors regulating the oestrous cycle and their abnormally early breeding season. These data will be helpful in developing a programme for the return of Père David's Deer to the wild in China. Dr Loudon visited several potential sites for the reintroduction in China with Dr H. Jungius of the World Wildlife Fund (International).

Comparative Medicine

Applied Immunology

Drs A. Voller and D. Bidwell continued their work on the development of simple immunodiagnostic methods for infectious diseases in man and animals. Attention was focused on the use of monoclonal antibodies which facilitates rapid specific enzyme-immunoassays (ELISA). Collaboration was established with the Hospital for Tropical Diseases, Bangkok, for the development of improved assays for the rapid detection and identification of snake venoms (Russell's Viper venom in particular). A quantitative test for amoebiasis in the faeces of infected individuals was established by Dr M. Grundy and this test is now being introduced for clinical use. A novel application for ELISA was developed to identify the species' sources of blood meals in insects. This is important in disease control, as it can clarify both the insect vector and the wild or domesticated animals that are the reservoirs of the disease.

Microbiology

Studies on vaccination against 'lumpy jaw' disease of Wallabies were pursued by Dr G. R. Smith. *Fusobacterium necrophorum*, the main causative bacterium appears unusual in producing a very low immune response. The disease can sometimes be treated with antibiotics if it is diagnosed early, but a vaccine would be much more effective. Unfortunately there are major problems in developing a vaccine before the reasons for the poor immune response are understood. Few pathogenic bacteria are known to present such difficulty, and the possible reasons are now under investigation.

Mr M. Kibe studied the 'F38 mycoplasma' that causes contagious pleuropneumonia of goats. Cross-immunization tests showed protective antigens shared by F38 and related mycoplasmas. The investigations are now being supplemented by enzyme assay and immunoblotting techniques with a view to development of a vaccine. The project is of considerable economic importance in Kenya where complementary studies are being carried out as a part of the same research programme.

A serious and often fatal disease affecting horses fed 'big bale' silage in four riding stables in south-east England was confirmed in the laboratory by Dr Smith as type B botulism. Forty-nine frozen samples of body fluids and gut contents from horses diagnosed as suffering from grass sickness, supplied by the Equine Research Station, were examined for evidence of botulism, with negative results, helping to clarify the confusion often found in diagnosing botulism and grass sickness. A hot summer led once again to numerous requests, for the diagnosis of type C botulism in waterfowl, from the Royal Parks, Department of the Environment, and the Greater London Council. A number of rare birds diagnosed with the disease were treated successfully in the Animal Hospital and released again to the parks.

Nutritional Biochemistry

Professor M. Crawford and his staff continued their basic studies of essential fatty acids and the requirements for them

in the prevention and treatment of a number of animal and human diseases. Analyses of the diets of Dolphins in captivity suggested the necessity for increasing the amounts of linolenic acid, as tissue analysis of animals in the wild showed richer content of this particular fatty acid. Studies of Chicks suffering from ' crazy chick ' disease allowed determination of the balance of fatty acids necessary in the diet to prevent the disease and to improve survival.

Progress was made also in studies of aspects of human nutrition. For example, disturbances of membrane lipids resulting in malfunction of red blood cells were found in patients suffering multiple sclerosis. A new diet was formulated and preliminary results suggest that there may be ways in which this aspect of the disease may be alleviated.

Radiology

Professor G. du Boulay completed his studies of the cause of arterial narrowing after subarachnoid haemorrhage, finding that the harmful effects are probably caused by the release of blood platelets in the subarachnoid space. In a study of the effects of high fat diets on cerebral arteries, Professors du Boulay and Crawford showed that treatment with dihomo-gamma linolenic acid could reverse blood pressure changes caused by high fat diets.

In order to develop non-stressful, non-invasive ways of diagnosing disease or monitoring reproduction in animals, Mrs O. Wilson explored several new avenues in the use of ultrasound. Among the successful applications now in routine use are the early detection of pregnancy in Dolphins, Blackbuck and Opossums; the scanning of reptile and bird eggs to confirm fertilization; and the sexing of monomorphic snakes and of Beavers. Ultrasound is also proving valuable in studying embryonic and foetal development in monkeys.

Conservation and Welfare

Conservation Genetics

Dr Georgina Mace, who is Conservation Co-ordinator for the National Federation of Zoological Gardens of Great Britain and Ireland, initiated a number of projects to improve the conservation and breeding of endangered animals in zoos. A computer-based inventory of over 1,000 birds and mammal species in British zoos was established and studies of the genetic-based management of the populations commenced. New computer programmes are being developed to help analyse pedigree status, degrees of inbreeding and ways in which future breeding should be managed. Programmes are also being developed to assist in the reinroduction of particular species to the wild.

Professor Sir Cyril Clarke, FRS, is Honorary Research Fellow in Genetics at the Institute of Zoology. In a study of the effects of industrial melanism and pollution on the colour forms of the Peppered Moth in Lancashire, he showed a reduction in the black form from 94% in 1960 to 64% in 1980. The relevance of this as an indication of sulphur dioxide levels and their effects on lichen populations is now being investigated.

Birds and Reptiles

Mr P. Olney and his staff continued to study the breeding biology and to improve procedures for the incubation, hatching and rearing of birds and reptiles. Useful information was collected on a number of rare species, in particular the Bateleur Eagle. Mr D. Ball studied the effects of various incubation techniques on the hatchability and early growth and survival of reptiles. Twenty Leopard Ground Gecko eggs incubated at a reduced temperature of 27°C hatched all females; providing more information on the temperature manipulation that can be used to alter the sex ratio. Further work was initiated to improve the nutritional value and the palatability of diets for reptiles.

Mammals, Aquarium and Insects

Progress was made with two interesting ecological studies supervised by Dr B. Bertram. Mr R. Brett completed his field study of Naked Mole Rats in Kenya and established a successful captive colony, living in a tunnel system of clear perspex tubes to allow continual observation, designed and constructed in the Institute's workshop. The colony is breeding well and provides opportunities for detailed behavioural and physiological work on the social organization of this species. Mr D. Moltu continued to study the ecology and behaviour of urban Grey Squirrels in Regent's Park. A reintroduction programme with Red Squirrels was started that involved translocation of superfluous animals from Scotland and releasing them, after a period of acclimatization and fitting with small radio transmitters, into Regent's Park.

Whipsnade

The unique opportunities that Whipsnade holds for studies of the ecology, physiology and behaviour of large mammals were further pursued this year with several studies of the factors controlling seasonal breeding in Père David's Deer and Bennett's Wallabies; the hormones and behaviour of Sika Deer; and the physiological response of Ungulates to improved methods of sedation. In addition, studies of copper metabolism in Chinese Water Deer, the mother-offspring relationship in Japanese Sika Deer and the anatomy and function of the digestive tract in ruminants were completed.

General Matters

Catering Department and Zoo Restaurants Limited

LONDON ZOO

As mentioned earlier, the renovated cafeteria was opened in June and named as The Café in the Zoo. Grandmet Compass Services are now able to improve the range and quality of food on offer but as the cafeteria was closed for over five months a loss was incurred by the Society this financial year.

The Members' Restaurant, which had not been financially viable for many years, was further adversely affected by the opening of the new facility, so at the end of the year it was transferred to the Tavern Bar where it will be known as The Restaurant in the Zoo. The previous venue will continue to be available for functions; there were day and evening functions totalling 207 during the year compared with 170 in 1983.

WHIPSNADE PARK

Whipsnade Park Catering Department continues to be operated by the Society but had a difficult year with the resignation of the Catering Manager and the prolonged illness of her Assistant. Grandmet Compass Services provided a relief manager for four months at the peak season.

There were 33 pre-booked functions compared with 38 in 1983.

Zoo Enterprises Limited

Zoo Enterprises operate the retail shops at London Zoo and Whipsnade Park. The larger visitor numbers of the last two years have helped these shops to spread their overheads and increase the financial return to the Society. During 1984 total sales increased by 10% and the financial contribution to the Society by 33%.

Sales at London Zoo were helped by the re-organization of the Main Gate and the installation of a new kiosk.

The Design and Information Unit

The Design and Information Unit was created at the beginning of the year with a broad brief covering all aspects of the Society's graphics and signing but with particular emphasis on developing information and displays for visitors to the two Zoos.

The Unit carried out three major projects during the year: the Apes and Monkeys Exhibition, the Red Squirrel Watch Project and the Small Mammals Exhibition in the Clore Pavilion at London Zoo.

Public Relations

The Society and its Zoos continued to receive extensive coverage by the media in both editorial and news areas. In particular the major events mentioned earlier at London Zoo and the news of the Dolphins and of the Children's Zoo at Whipsnade, were well reported.

The Society was invited to be represented on several news programmes to discuss the acceptance or rejection of zoos and this gave members of the staff good opportunities to explain to a wide audience some of the lesser known facts about zoos.

'Photocalls' to introduce new births and arrivals continued. The arrival of a new male Gorilla and the births of a wide variety of ungulates on the Cotton Terraces were featured at London, whilst 'Photocalls' at Whipsnade concentrated on promoting the new Children's Zoo.

A series of new radio advertisements for Whipsnade were used in both the Chiltern and London areas.

Two market research exercises were carried out during the year; the first, at London Zoo, analysed party bookings to help improve group sales and the second, at Whipsnade during the summer months, provided useful data for planning the future of the Zoo and enhancing its appeal to the public.

Staff

At the end of the year there were 412 full-time members of staff. A list of the senior members of staff is given in Appendix 2.

GENERAL

During the latter part of the period when Lord Zuckerman was Secretary and then President of the Zoological Society of London, as recorded on page 3, the daily management and running of the two Zoos was in the hands of one man, Colin G. C. Rawlins, Director of Zoos, 1966–December 1983, and Chief Executive Officer from January 1984 until his retirement on 30 June 1984. The daily passage of the public through London Zoo and through Whipsnade, free of alarms and excursions, conceals the dedication and loyalty of the Director and the staff. The organization of rosters for all sections of the staff to provide full manning throughout every day of every week of every month of the year, for the smooth running of the services required for both the Collections, to say nothing of the visitors, is too easily taken for granted when the system works smoothly. Colin Rawlins' effective supervision ensured the smooth running. For the last four years of his service he assumed the additional responsibility of Director of Administration. Largely due to many initiatives taken by the Society, Zoo business is an international business. Colin Rawlins by his active participation in meetings with colleagues from Zoos in many countries became internationally known, liked and respected which added to the prestige of the Society. This was recognised by his appointment as President of the International Union of Directors of Zoological Gardens from 1977–1980. The gratitude and the good wishes of the Society accompany him into his retirement.

In January Mr D. M. Jones, Senior Veterinary Officer and Assistant Director of Zoos, was appointed Director of Zoos. Mr J. L. Boyer, who joined the staff as Chief Executive Officer (Designate) in January took over the substantive duties of the post after the retirement of Mr Rawlins.

By longstanding agreement the general pay increases for the staff continue to be aligned to those of various outside bodies, mainly in the public sector.

Ten places under a Youth Training Scheme in the animal departments attracted over 90 applications. The required off-the-job training has been arranged with Paddington College, who also play a large part in our normal keeper training. We are most grateful to Mrs Ryan and Mr Higgins of Paddington College for the considerable time and effort they have devoted to our training needs.

A work placement under a YTS scheme managed by North London College was also offered in the Wellcome Laboratories.

The Society was again able to offer training to other Zoo personnel, some from overseas, in the animal departments, for veterinary students in the animal hospital, as well as short periods of experience in clerical work to some teenagers undertaking office and/or business studies.

Thirteen staff were successful in the final certificate for the Ordinary Certificate in Zoo Animal Management and eight completed the first year of the course for the Higher Certificate.

Awards

The completion of 25 years' continuous service was recognized by the presentation of gold watches to Mr J. F. Brown, Retail Manager, London Zoo, Mr R. A. Fish, Librarian, London Zoo, Mr R. D. Poland, Electrical Services Supervisor, London Zoo and Mr S. B. Savage, Head Keeper, Reptile House, London Zoo.

Appointments and Promotions

Mr D. J. Ball, Assistant Curator, London Zoo
Mr P. J. Duckett, Finance Officer
Mr J. D. Fairlamb, Head Forester, Whipsnade Park
Mr W. J. Griffiths, Head of Design & Information Unit
Mr G. M. Henderson, Avian Pathologist, Institute of Zoology, London Zoo
Dr J. K. Kirkwood, Senior Veterinary Officer
Mr M. J. Llovett, Senior Animal Technician, Institute of Zoology, London Zoo
Mr J. P. McCorry, Public Services Manager, London Zoo
Dr D. T. Smith, Assistant Education Officer, London Zoo
Mr P. R. Summers, Head Gardener, London Zoo

Resignations and Retirements

Retirements included Mr R. Humphrys, Head Keeper, Insect House, after 43 years; Miss Joan Ford, Secretary, Institute of Zoology, after 36 years; Mr J. Folds, Head Gardener, Whipsnade Park after 23 years; Mrs Barbara Murrill, Senior Animal Technician, Institute of Zoology, after 20 years.

Obituary

We regret to record the death of the following pensioneers: Mrs B. Carmoody, Mrs J. Tiller and Messrs G. Gammon, A. Pritchard, W. Read, F. Warner and W. Zealand.

Acknowledgements

The Council wishes to thank all those Fellows and others who greatly aid the work of the Society by giving their time to serve on advisory committees.

The help given by many scientists, veterinarians, firms and organizations is also much appreciated. The Council would like to thank: The National Provident Institution for generous sponsorship of the Red Squirrel reintroduction project and the Red Squirrel Watch programme; the staff of the Nairn Estate, and Volvo Concessionaires, for assistance with capturing and transporting squirrels; the many organizations and private individuals, too numerous to list, who kindly donated animals, large or (mainly) small; Robert Atkinson, Jackie Mills and Diana Haskell, for voluntary assistance to the Curator of Mammals; Dr Mauvis Gore for voluntary work completing the Giant Panda studbook; the many volunteers, some from the XYZ Club, who have worked as helpers to our keepers during the year; Mrs M. Ryan of Paddington Technical College for her running of the Zoo Animal Management courses; Lord Coke and Mr Dickerson for providing Evergreen Oak from the Holkham Estate for our browsing mammals; The Parks Department of Regent's Park for help with logs and branches for cage furnishing; Mr Pat Scholls, MAFF Fisheries Laboratory, Lowestoft, for help in obtaining marine fish and sea water for the Aquarium; Mr Richard Sankey and Mr Philip Whitfield of the Tropical Marine Centre for advice and help with Aquarium filtration systems; Mr V. Lunn, Head Riverkeeper, River Test, Mr P. Brill, Lock and Weirkeeper at Cartagna Weir, Mr W. Newton, Lock and Weirkeeper at King's Weir, Mr H. Harris of the Tewin Mill Trout Farm, and Mr N. Tomlinson of the East Anglian Water Authority, for help with freshwater fish for the Aquarium; The Tropical Development and Research Institute for supplying surplus insects; Mrs K. Emmerson, for a photograph of 'Guy' the Gorilla, taken by Miss G. Knowles; Dr P. A. J. Ball and the staff of Middlesex Hospital for help with emergency snake-bite treatment, and Dr D. Warrell of the Radcliffe Infirmary, Oxford, for advice on snake-bite treatment; Miss A. Grandison and the staff of the Herpetology Department of the British Museum (Natural History) for advice and assistance; Corporation of London Animal Quarantine Station at Heathrow for the care of incoming animals; Royal Botanic Gardens, Kew for their generous help; Mr H. P. Liquorish of the Conservators of Epping Forest for providing materials for decorating reptile cages; Bedford College, University of London, for plant material.

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York; Institute of Neurology; Mr A. Ionides; Janssen Pharmaceutical Ltd; James Hugh Group; James Scientific Instruments Ltd; Messrs Kemble & Pinney; Mr B. Lancaster; Leptospira Reference Laboratory; London School of Hygiene & Tropical Medicine; Luton & Dunstable Hospital; Luton Public Health Laboratory; MAFF Laboratories; Lowestoft and Shinfield; Ministry of Forestry, People's Republic of China; MRC Reproductive Biology Unit, Edinburgh; Norwich V.I. Centre; Picker International Ltd; Radcliffe Infirmary, Oxford; Mr H. W. Reid; Regional Virus Laboratory, Birmingham; Royal College of Surgeons; Royal Free Hospital; Royal Veterinary College; Sandoz Products Ltd; Sutton Bonington V.I. Centre; Mr J. Tattersfield; University College London; Mr T. Wade; Wellcome Research Laboratories, Berkhamsted; the late Mr W. L. Whitehouse, FRCS, FRCOG; and Richard Wolf Ltd of West Germany.

ARCHITECTS DEPARTMENT by Mrs M. Maxwell; Management by Air Ltd.

EDUCATION DEPARTMENT by Mrs C. Aickin, Mrs M. Amis, Mr K. Archer, Mrs N. Barnett, Mr J. Barrington-Johnson, Miss T. Barton, Mrs M. Bates, Miss J. Beattie, Mr D. Bell, Mrs F. Bell, Mrs J. Betts, Mrs R. Billsborough, Mrs D. Boyd-Gibbons, Miss M. Bromwich, Miss S. Brough, Miss J. Brown, Miss N. Bryant, Mrs R. Bungey, Mrs E. Burroughs, Mrs M. Carmichael, Mr N. Cattermole, Miss Chan Fun Lan, Miss V. Clarke, Mrs J. Coffey, Miss L. Coole, Mrs L. Cooledge, Miss J. Cottrell, Miss B. Creasey, Mrs I. Cruickshank, Mr M. Culpan, Miss J. Cuthbert, Mrs A. Darby, Mrs M. Davis, Mrs J. Deco, Mr D. De Souza, Mrs K. Dixon, Mrs A. Dockley, Mr D. Doyle, Mrs L. Dunkley, Mrs V. Edwards, Mr V. Egan, Mrs J. Eggmore, Mr D. Elbourn, Mrs M. Elson, Miss L. England, Mrs M. Fane, Mr D. Finlay, Miss E. Formoy, Miss M. French, Miss J. Gilbert, Mrs M. Godwin, Miss J. Golding, Mrs E. Grabow, Mr A. Greenshields, Miss A. Gurney, Miss P. Haddleton, Mrs M. Hamilton, Miss K. Hamilton-Whyte, Mrs B. Harrison, Mrs P. Healy, Mrs S. Heinemann, Mrs K. Herbert, Mr J. Heywood, Mr M. Ilott, Miss S. Jackson, Miss K. Jamilly, Mrs A. Jefferey, Mrs M. Jenkins, Mrs S. Jespersen, Miss A. Jessup, Mr P. Johnson, Mrs J. Jones, Miss G. Kalsi, Mrs B. King, Mr E. King, Mrs P. Lacy, Mr T. Law, Miss J. Lewis, Miss C. Limtouch, Miss E. Logan, Mrs G. Lubin, Mr D. Lumley, Ms F. Mabert, Mrs P. Mann, Miss F. Manning, Mrs J. Marjot, Mrs A. Maskell, Miss F. Masters, Miss K. Matsuoka, Mrs B. May, Miss C. McDermott, Miss M. McKay, Ms F. McKibben, Mrs W. McLerie, Mrs J. McRae, Miss I. Mee Ling, Mrs A. Montefiore, Miss F. Moore, Mr H. Moore, Miss S. Moriarty, Mrs K. Morrice, Ms A. Muhr, Mrs F. Myer, Mrs D. Neild, Miss L. Newmark, Mr A. Nicol, Mrs R. Nixon, Ms. M. O'Connor, Ms A. O'Leary, Mrs Y. Oliver, Miss T. Parker, Miss J. Patrick, Mr S. Peirce, Mr N. Pilgrim, Mrs M. Pittman-Jones, Mrs A. Plunkett, Mr D. Pond, Miss A. Porter, Mrs J. Pracey, Mrs B. Raybould, Mr A. Reynolds, Mr D. Richards, Mrs M. Richards, Mrs B. Richardson, Mrs D. Roberts, Miss J. Roberts, Mrs M. Rook, Ms J. Rumsey, Mrs M. Russell, Mrs J. Ryder, Ms C. Sayers, Mrs H. Sharp, Mrs J. Sherman, Ms R. Shoenberg, Mrs S. Simon, Mr A. Skidelsky, Ms S. Skull, Miss M. Slinn, Mrs J. Smith, Miss R. Smith, Mrs R. Soden, Mr T. Spiers, Mr D. Squire, Mrs A. Steiner, Mrs S. Stevens, Miss D. Stott, Mr D. Stroud, Mrs B. Suschitzsky, Mrs S. Sussman, Mrs M. Thomas, Mrs T. Thrower, Mr R. Tomlinson, Mrs K. Veall, Mr S. Wakeling, Mrs M. Wallis, Mrs D. Ward, Mr J. Ward, Miss M. Welsh, Ms A. Williams, Mrs R. Williams, Mr S. Williams, Mrs I. Wingrove, Mrs H. Wohl, Miss B. Wood, Miss E. Wood, Mr D. Wooderson, Miss J. Woodley, Mrs S. Wrigley, Mrs L. Yates. Mrs S. Wrigley and Mrs L. Yates, who took part in the programme of activities designed to help visitors to The London Zoo. Thanks are also due to the Inner London Education Authority, to Harrow College of Higher Education, Mr Mr Nick Exton and Mr John Holden, to Cotswold Wildlife Park, Kilverstone Park, Twycross Zoo, The Royal Society for the Protection of Birds and to the staff of the University of Oxford's Department of Zoology, who took part in the Sixth Form Symposia.

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R. M. Laws.
Secretary

Committees 1984-1985

Management Committee

Terms of Reference: To advise Council on all financial, commercial and marketing aspects of the Society's activities; to be responsible for the preparation of the Society's annual operational budget for the Council's approval and to monitor its progress; to monitor expenditure on capital projects provided for under separate funds; to be responsible for the planning and monitoring of all the Society's commercial activities, including pricing policy and the advertising, promotion and marketing programmes.

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The Hon. William McAlpine
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The Rt. Hon. Lord Peyton of Yeovil, *Chairman*
Sir Richard Way, KCB, CBE
Sir Philip de Zulueta, MA
Secretary: J. L. Boyer, OBE

Animal Welfare and Husbandry Committee

Terms of Reference: To advise Council on matters relating to animal welfare, husbandry and breeding records in the Collections at both Regent's Park and Whipsnade Park, particularly in relation to the work of the Society's Curators and Veterinary Officers.

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T. A. P. Walker
Secretary: D. M. Jones, BSc, BVetMed, MRCVS, FIBiol

Awards Committee

Terms of Reference: The Council presents awards for contributions to zoology; The Stamford Raffles Award, The Scientific Medal, The Thomas Henry Huxley Award, The Silver Medal, The Zoological Society of London Frink Medal for British Zoologists and The Prince Philip Prize. The Committee advises Council on all matters relating to these awards.

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Professor G. Chapman, MA, PhD, FIBiol
Professor B. K. Follett, PhD, DSc, FRS
P. H. Greenwood, DSc, FIBiol, FLS
J. G. Sheals, PhD ,FIBiol
Professor J. E. Webb, DSc, PhD, *Chairman*
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Terms of Reference: To advise Council on all matters relating to the Society's educational activities.

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Professor W. S. Bullough, DSc, *Chairman*
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Mrs Frances Rogers
Mrs Marion Rook
J. Sparks, BSc, PhD
D. J. Stanbury, BSc, ARCS
Secretary: M. K. Boorer, BSc, DipEd

Gardens and Park Committee

Terms of Reference: To consider matters relating to the layout, appearance, animal housing and amenities other than catering, of the Gardens, Regent's Park and Whipsnade Park; to consult where necessary with other committees and to report to the Council so that the advice of the Committee can be taken into account in future planning.

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R. d'Erlanger
A. M. J. Galsworthy
E. Hutchison, MA(RCA), DipLA, ALI
C. Masson
The Hon. William McAlpine
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Education Department:
Education Officer: M. K. Boorer, BSc, DipEd
Assistant Education Officers: Alison J. Mainwaring, BSc, PhD; D. T. J. Smith, BSc, PhD; Gillian E. Standring, MA, CertEd
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Administrative Assistant: Connie Nutkins
Laboratory Superintendent (Nuffield): P. R. E. Wallace, FIST
Laboratory Superintendent (Wellcome & Hospital): G. F. Nevill, HNC
Computer Consultant: G. F. Moore, BA, MSc

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Development Biology
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Research Fellows: D. H. Abbott, PhD; J. K. Hodges, PhD (Zuckerman Research Fellow)
Honorary Research Associate: T. B. Poole, PhD (until September)
Research Assistants: Sally-Ann K. Eastman, PhD (until March); K. M. Kendrick, PhD (until April)
Postgraduate Research Student: D. H. R. Harris, BSc
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Research Fellows: W. V. Holt, PhD; H. D. M. Moore, PhD (Zuckerman Research Fellow)
Research Associates: D. H. Ellis, PhD (until February); Caroline A. Smith, PhD
Postgraduate Research Student: Linda M. Baggott, MSc
Reproductive Ecology
Research Fellow: A. S. I. Loudon, BA, PhD
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Research Associate: D. E. Bidwell, PhD
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Research Fellows: Professor M. A. Crawford, PhD; Wendy Doyle, Dip-Dietetics; W. R. Hare, PhD
Research Assistants: M. Leighfield, MSc; E. Anne Lennon, BSc
Visiting Research Workers: Professor P. Budowski, PhD(Israel); D. de Fornel, MSc(France)
Radiology
Research Fellow: Professor G. H. du Boulay, MB, BS, FRCP, DMRD, FRCR
Honorary Research Associate: D. J. Boullin, MSc, PhD, MA (until September)
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Postgraduate Research Student: Jacqueline A. Wastell, BSc
Conservation Genetics
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Curator: B. C. R. Bertram, MA, PhD, FIBiol
Honorary Research Fellow: Professor A. J. E. Cave, MD, DSc, FRCS, FLS
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Whipsnade Park
Curator: V. J. A. Manton, MRCVS, FIBiol

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Haematology
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Pathology
Pathologist: G. M. Henderson, BA, VetMB, MRCVS (from October)

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International Zoo Yearbook:
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Journal of Zoology, Symposia
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Maintenance Manager: L. G. Taverner
Overseer of Birds: R. Barrow
Overseers of Mammals: R. B. Willis (to May); T. B. Kichenside; R. R. Smith FIAT (acting from May)
Public Services Manager: J. P. McCorry
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Aquatic Birds and Birds of Prey: D. N. Wood
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Bird House: W. G. R. Daines
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Parrot House: R. J. Watkins
Pheasantry and Ostrich House: D. R. Ellis
Reptiles:. S. B. Savage
Small Mammals: R. R. Smith, FIAT
Ungulates: J. Nicklin

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Park Manager: O. C. Chamberlain
Veterinary Officer: R. A. Kock, MA, VetMB, MRCVS*

*Also members of the Institute of Zoology

Catering Manager: Brigid Heley (to April)
Head Forester: J. D. R. Fairlamb (from June)
Head Gardener: J. Folds (to July)
Senior Overseer: G. Stanbridge
Overseer: J. Datlen
HEAD KEEPERS:
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Southern Ungulate Section: A. W. Billington
Northern Ungulate Section: P. J. Williams
Carnivore Section: G. Lucas
Elephant Section: J. Weatherhead
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Consulting Staff

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Honorary Veterinary Consultant: W. H. G. Rees, BSc, DVSM, MRCVS
Medical Referee: J. P. Horder, CBE, FRCP, PRCGP, FRCPsych

Publications by Society's Staff and Research Workers

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Animals in the Collections

column 1	Number of animals in the Collection at 1st January 1984.
column 2	Number of animals received in 1984 by presentation, exchange, deposit, purchase or transfer between the Society's two Collections. The figures in brackets indicate animals which have been so transferred.
column 3	Number of animals born or hatched in 1984.
column 4	Number of animals which died in 1984 within 30 days of birth or hatching. The figures in brackets indicate animals born or hatched during December 1983 and which died during January 1984. Stillbirths are not included.
column 5	Number of animals which died from natural causes during 1984 apart from those included in Column 4.
column 6	Number of animals disposed of in 1984 by presentation, exchange, deposit, sale or transfer between the Society's two Collections, as well as culled animals and those killed by vermin or vandals. The figures in brackets indicate animals which have been transferred between the two Collections.
column 7	Number of animals in the Collection at 31st December 1984, showing sexes where these are known, e.g. 1/3/1 indicates 1 male, 3 female, 1 sex unknown.

Key

G Genus new to the Collection
S Species new to the Collection
SS Sub-species new to the Collection

*Species subject to the Agreement with the Marwell Preservation Trust on joint ownership and management.

REGENT'S PARK

		1	2	3	4	5	6	7
Mammals								
MONOTREMATA								
Tachyglossus aculeatus	Australian Echidna	1	—	—	—	—	—	1/0
Zaglossus bruijni	Bruijn's Echidna	3	—	—	—	—	—	1/2
MARSUPIALIA								
Metachirops opossum	Four-eyed Opossum	—	2	—	—	—	—	1/1
Phalanger gymnotis	Grey Ground Cuscus	—	3	—	—	—	—	2/1
Petaurus breviceps	Sugar Glider	20	—	—	—	7	—	8/5
Dactylopsila trivirgata	Striped Possum	1	—	—	—	1	—	—
Trichosurus vulpecula	Brush-tailed Possum	2	—	—	—	1	—	0/1
Dasyuroides byrnei	Byrne's Pouched Mouse	4	—	—	—	1	—	1/2
Sarcophilus harrisi	Tasmanian Devil	2	—	—	—	—	—	1/1
Vombatus ursinus	Common Wombat	2	—	—	—	—	—	1/1
Potorous tridactylus	Long-nosed Potoroo	7	7	1	1	4	2	2/5/1
Macropus parma	White-throated Wallaby	3	1	—	—	1	—	1/2
Macropus rufogriseus	Red-necked Wallaby	2	1	1	—	1	1	2/0
Macropus fuliginosus	Western Grey Kangaroo	3	—	1	—	1	—	1/2
Dendrolagus goodfellowi	Goodfellow's Tree Kangaroo	1	—	—	—	—	—	0/1
		1	**2**	**3**	**4**	**5**	**6**	**7**

		1	2	3	4	5	6	7
INSECTIVORA								
Echinops telfairi	Pygmy Hedgehog Tenrec	2	—	—	—	—	—	1/1
Erinaceus europaeus	European Hedgehog	1	5	—	—	4	—	1/1
Paraechinus aethiopicus	Desert Hedgehog	6	—	2	2	1	—	3/2
Crocidura russula	White-toothed Shrew	18	—	—	—	17	—	0/1
MACROSCELIDEA								
Elephantulus rufescens	Rufous Elephant Shrew	1	—	—	—	1	—	—
CHIROPTERA								
Pteropus giganteus	Indian Fruit Bat	21	—	5	—	4	1	2/10/9
Carollia perspicillata	Seba's Short-tailed Bat	—	40	—	—	3	—	0/0/37
SCANDENTIA								
Tupaia belangeri	Common Tree Shrew	17	1	9	—	3	6	6/9/3
Lyonogale tana	Large Tree Shrew	8	—	1	1	2	—	3/3
PRIMATES								
Lemur catta	Ring-tailed Lemur	3	5	—	—	—	3	2/3
Lemur fulvus	Brown Lemur	4	7	2	2	—	4	3/4
Lemur mongoz	Mongoose Lemur	2	—	—	—	—	—	1/1
Varecia variegatus	Ruffed Lemur	10	—	5	3	1	5	3/2/1
Cheirogaleus medius	Fat-tailed Dwarf Lemur	2	—	—	—	—	—	1/1
Microcebus murinus	Grey Mouse Lemur	6	—	3	—	—	1	5/3
Loris tardigradus	Slender Loris	2	1	—	—	—	—	2/1
Nycticebus coucang	Slow Loris	7	4	—	—	—	2	3/6
Galago crassicaudatus	Thick-tailed Bushbaby	1	—	—	—	—	—	1/0
Galago senegalensis	Senegal Bushbaby	1	2	—	—	1	—	1/1
Aotus trivirgatus	Douroucouli	7	4	—	—	—	5	3/3
Pithecia pithecia	White-faced Saki Monkey	7	—	4	—	4	2	3/2
Cebus apella	Brown Capuchin	7	—	1	—	—	—	4/3/1
Saimiri sciureus	Squirrel Monkey (Olive-capped form)	10	1	3	—	—	—	3/5/6
Ateles geoffroyi	Black-handed Spider Monkey	—	2	—	—	—	—	1/1
Callithrix jacchus	Common Marmoset	15	6	11	5	—	7	5/8/7
Callithrix argentata	Silvery Marmoset	4	—	—	—	—	4	—
Cebuella pygmaea	Pygmy Marmoset	2	4	—	—	—	1	4/1
Saguinus oedipus	Cotton-headed Tamarin	4	10	2	2	1	9	2/2
Saguinus illigeri	Red-mantled Tamarin	10	1	2	1	1	5	4/2
Saguinus imperator	Emperor Tamarin	2	3	—	—	—	1	2/2
Leontopithecus rosalia	Golden Lion Tamarin	7	2	2	—	—	4	3/4
Callimico goeldi	Goeldi's Marmoset	6	—	4	1	2	—	5/1/1
Macaca silenus	Lion-tailed Macaque	2	5	—	—	—	1	2/4
Macaca nemestrina	Pig-tailed Macaque	17	1	2	1	—	1	4/12/2
Cercocebus atys	Sooty Mangabey	6	—	3	1	—	—	2/6
Mandrillus sphinx	Mandrill	4	—	2	—	—	—	2/4
Cercopithecus pygerythrus	Vervet Monkey	2	—	—	—	—	—	2/0
Cercopithecus diana	Diana Monkey	4	—	1	—	—	—	1/4
Cercopithecus talapoin	Talapoin Monkey	2	1	—	—	1	—	1/1
Colobus polykomos	Western Black & White Colobus Monkey	4	—	—	—	1	—	2/1
Hylobates lar	Lar Gibbon	5	—	1	1	—	3	1/1
Pongo pygmaeus	Orang Utan	12	3	—	—	—	5	6/4
Pan troglodytes	Chimpanzee	7	—	1	—	—	1	2/5
Gorilla gorilla	Gorilla	2	2	—	—	—	1	1/2
EDENTATA								
Myrmecophaga tridactyla	Giant Anteater	2	—	—	—	—	—	0/2
Choloepus didactylus	Two-toed Sloth	1	—	—	—	—	—	0/1
Dasypus novemcinctus	Nine-banded Armadillo	2	3	—	—	3	—	0/2
Chaetophractus villosus	Hairy Armadillo	2	—	—	—	—	—	1/1
RODENTIA								
Sciurus vulgaris	Red Squirrel	1	15	—	—	2	11	1/2
Ratufa bicolor	Malayan Giant Squirrel	2	1	—	—	1	—	1/1
Funisciurus pyrrhopus	Fire-footed Squirrel	2	—	—	—	—	—	1/1
		1	2	3	4	5	6	7

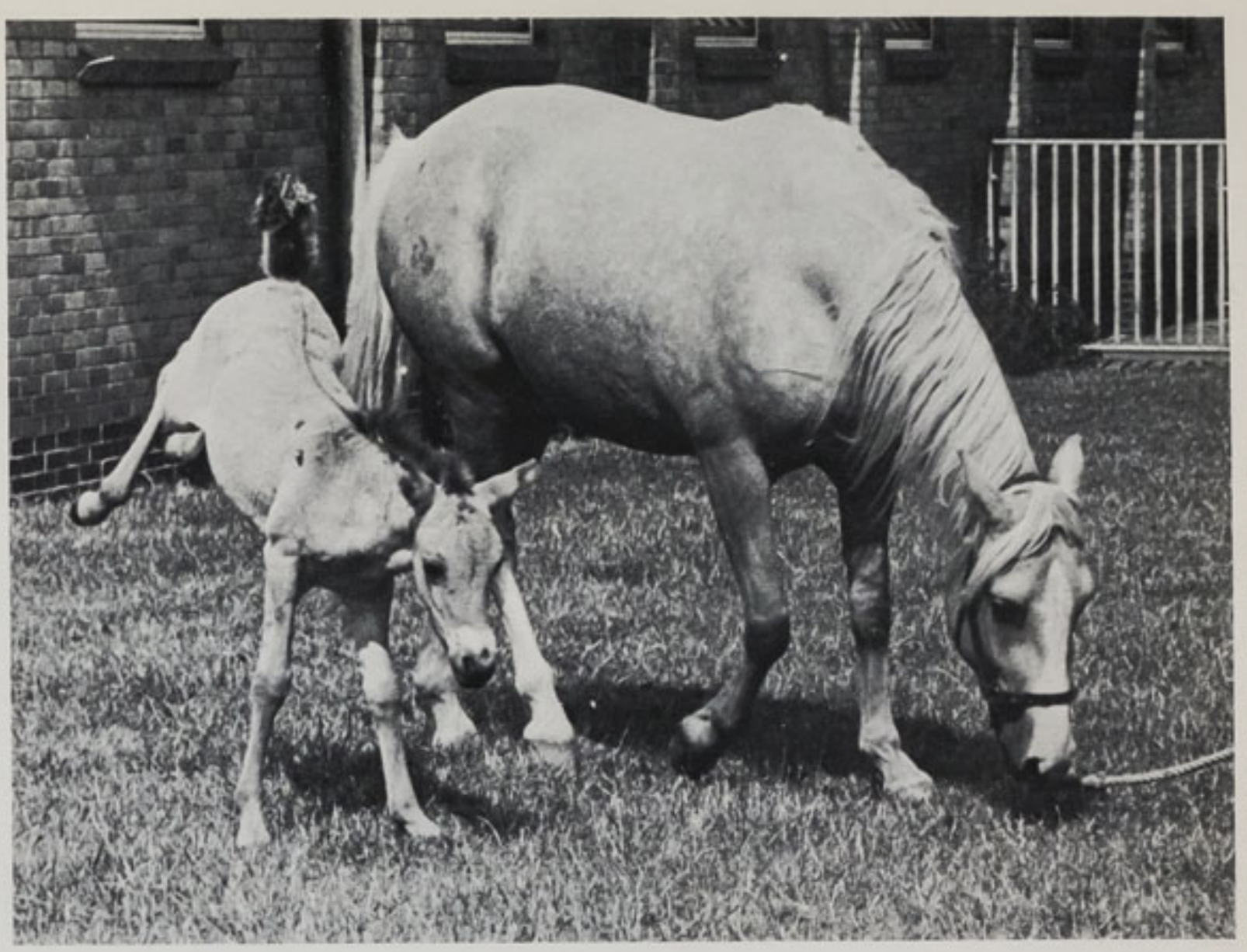
		1	2	3	4	5	6	7
Callosciurus finlaysoni	Finlayson's Squirrel	1	—	—	—	—	—	1/0
Marmota monax	Woodchuck	1	1	—	—	—	—	0/1/1
Cynomys ludovicianus	Prairie Marmot	6	—	—	—	—	—	4/2
Tamias sibiricus	Siberian Chipmunk	5	—	—	—	2	—	2/1
Petaurista alborufus	Red & White Flying Squirrel	1	—	—	—	—	—	1/0
Glaucomys sabrinus	Northern Flying Squirrel	6	—	—	—	—	1	2/3
Castor canadensis	Beaver	7	—	6	—	—	2	1/4/6
Pedetes capensis	Springhaas	4	—	—	—	1	—	2/1
Peromyscus maniculatus	White-footed Mouse	20	—	6	—	4	—	12/10
Sigmodon hispidus	Cotton Rat	28	—	49	—	7	33	4/5/28
Phodopus sungorus	Dwarf Hamster	72	—	100	—	42	82	13/11/24
Cricetulus barabensis	Chinese Hamster	55	—	15	—	26	19	14/8/3
Meriones unguiculatus	Clawed Jird	14	—	—	—	7	—	4/3
Clethrionomys glareolus	Bank Vole	35	—	37	—	34	9	3/4/22
Microtus agrestis	Field Vole	23	—	10	—	14	2	6/7/4
Phloeomys cumingi	Philippine Cloud Rat	3	—	1	—	—	—	2/2
Apodemus sylvaticus	Field Mouse	40	—	18	—	7	19	9/16/7
Micromys minutus	Harvest Mouse	15	—	6	—	15	—	2/4
Thamnomys dolichurus	Long-tailed Thicket Rat	1	—	—	—	—	—	1/0
Acomys cahirinus	Arabian Spiny Mouse	70	—	106	—	13	76	25/34/28
Acomys russatus	Golden Spiny Mouse	17	—	7	—	4	3	3/4/10
Lemniscomys striatus	Striped Grass Mouse	3	—	—	—	3	—	—
Arvicanthis niloticus	Nile Rat	50	—	14	—	2	20	20/18/4
Praomys natalensis	Multimammate Mouse	24	—	—	—	19	2	1/2
Glis glis	Fat Dormouse	5	1	—	—	—	—	4/1/1
Jaculus jaculus vocator	Arabian Jerboa	20	—	34	15	22	—	4/11/2
Hystrix cristata	Crested Porcupine	1	—	—	—	—	—	1/0
Hystrix indica × *H. cristata*	Hybrid Indian × Crested Porcupine	3	—	—	—	—	—	1/2
Atherurus africanus	African Brush-tailed Porcupine	5	—	—	—	1	—	2/2
Coendou prehensilis	Brazilian Tree Porcupine	1	2	—	—	1	—	1/1
Kerodon rupestris	Rock Cavy	12	1	10	—	8	4	4/3/4
Dolichotis patagonum	Mara	5	—	1	—	1	—	3/2
Hydrochoerus hydrochaeris	Capybara	2	—	1	—	—	—	1/1/1
Cuniculus paca	Spotted Paca	2	—	—	—	—	—	1/1
Dasyprocta aguti	Orange-rumped Agouti	4	1	7	1	1	3	3/2/2
Myoprocta pratti	Green Acouchi	6	1	5	1	—	1	7/2/1
Chinchilla laniger	Chinchilla	4	1	—	—	2	—	2/1
Geocapromys brownii	Jamaican Hutia	8	—	—	—	1	—	5/2
Octodon degus	Degu	8	—	9	5	4	—	0/0/8
Proechimys guairae	Casiragua	21	—	1	—	3	6	5/7/1
Heterocephalus glaber	Naked Mole Rat	62	—	32	7	38	—	18/25/6
CARNIVORA								
Canis lupus	Grey Wolf	5	—	4	—	—	5	2/2
Alopex lagopus	Arctic Fox	2	—	—	—	—	—	1/1
Fennecus zerda	Fennec Fox	2	2	—	—	—	2	1/1
Urocyon cinereoargenteus	American Grey Fox	2	—	—	—	—	—	1/1
Selenarctos thibetanus	Asiatic Black Bear	2	—	—	—	—	—	0/2
Ursus arctos	Brown Bear	4	—	—	—	—	—	1/3
Ursus americanus	American Black Bear	1	—	—	—	—	—	1/0
Thalarctos maritimus	Polar Bear	2	—	—	—	—	—	1/1
Melursus ursinus	Sloth Bear	1	—	—	—	—	—	1/0
Ailuropoda melanoleuca	Giant Panda	2	—	—	—	—	—	1/1
Ailurus fulgens	Red Panda	1	—	—	—	—	1	—
Procyon lotor	Raccoon	2	—	—	—	—	—	1/1
Nasua nasua	Ring-tailed Coati	5	—	—	—	—	—	2/3
Potos flavus	Kinkajou	2	—	2	—	—	1	1/1/1
Mustela nivalis	Weasel	2	—	—	—	—	—	0/2
Mustela putorius	Polecat Ferret	—	4	—	—	—	—	2/2
Martes foina	Beech Marten	2	—	—	—	—	2	—
Arctonyx collaris	Hog Badger	2	—	—	—	—	—	1/1
Amblonyx cinerea	Oriental Small-clawed Otter	3	—	3	1	—	1	2/2
Genetta tigrina	Blotched Genet	2	—	—	—	—	—	1/1
Arctogalidia trivirgata	Small-toothed Palm Civet	3	—	—	—	—	—	1/2
Paguma larvata	Masked Palm Civet	1	—	—	—	—	—	1/0
Suricata suricatta	Suricate Meerkat	2	1	—	—	1	—	1/1
Mungos mungo	Banded Mongoose	2	—	—	—	—	—	1/1
		1	**2**	**3**	**4**	**5**	**6**	**7**

'Henny', the female Okapi born on 5 August, was the first Okapi to be born at London Zoo.

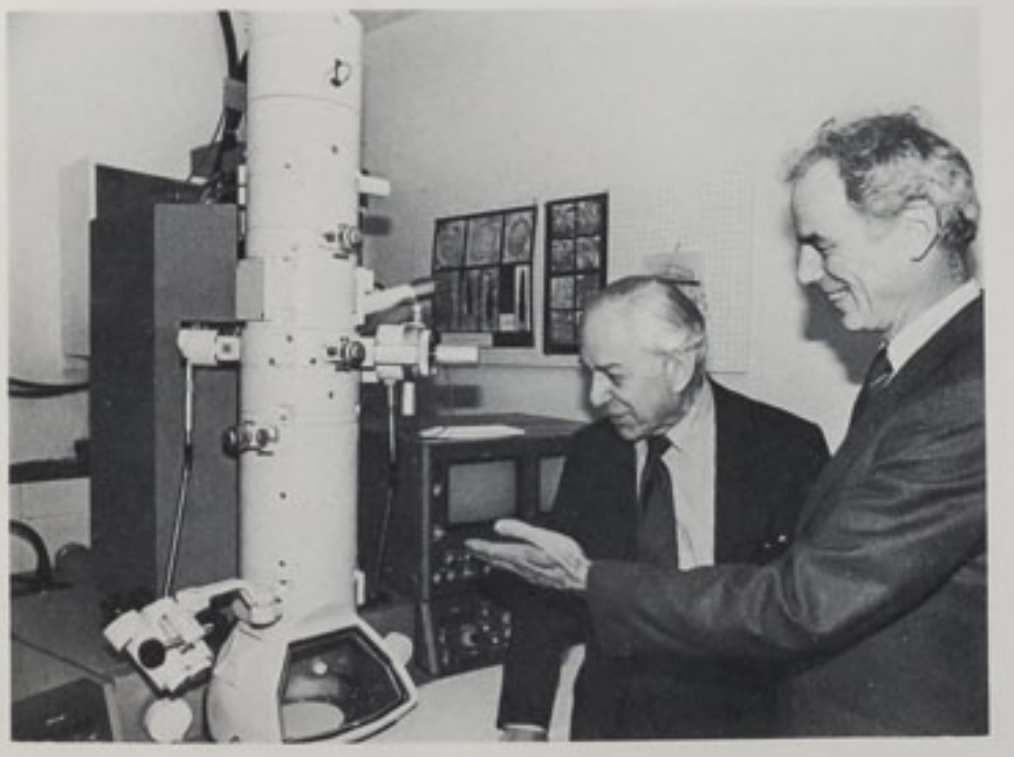
'Eva' with her baby 'Tessa', born on 11 August, the first Brazilian Tapir born at London Zoo since 1939.

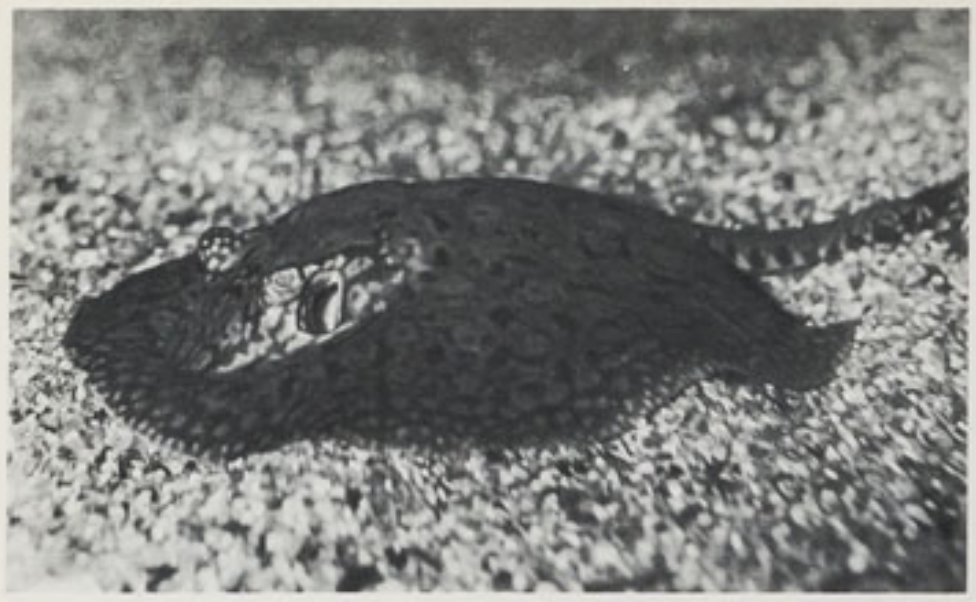
The Reptile Hatchery exhibit (*below left*) gave visitors a chance to see rare events such as the hatchings (*below*) of an Innes' Cobra and a Fat-tailed Gecko, both species bred for the first time in the UK.

Special events and new facilities for visitors. June was a notable month. *Above:* Mrs Reagan visited Regent's Park — Keeper Andy Baker shows her the Reindeer named ' Nancy ' in her honour (photo by Arthur Sidey, Daily Mirror). *Below:* at the opening of the Café in the Zoo, the remodelled fast-service cafeteria in Regent's Park, the President Sir William Henderson welcomes the first visitors. The Apes and Monkeys Exhibition also opened in June. *Left, from above:* displays and information throughout the grounds; making monkey masks in the Clore Pavilion; opening day — Senior Keeper Peter Dillingham showing children a Ruffed Lemur and David Bellamy with Orang-utan ' Suka '.



Research and husbandry behind the scenes. *Above:* 'Tarot', the first Przewalski's Wild Horse in the world to be born from the transfer of a Przewalski embryo to a domestic pony. Born on 8 June, he is shown with his surrogate mother. *Below:* Elf Aquitaine UK plc gave an electron microscope to the Institute of Zoology. Professor Lord Zuckerman receives it from Mr Arnaud Rousseau, the company's Chief Executive. *Right:* this young Bateleur Eagle hatched on 2 March after artificial incubation and was successfully hand-reared.



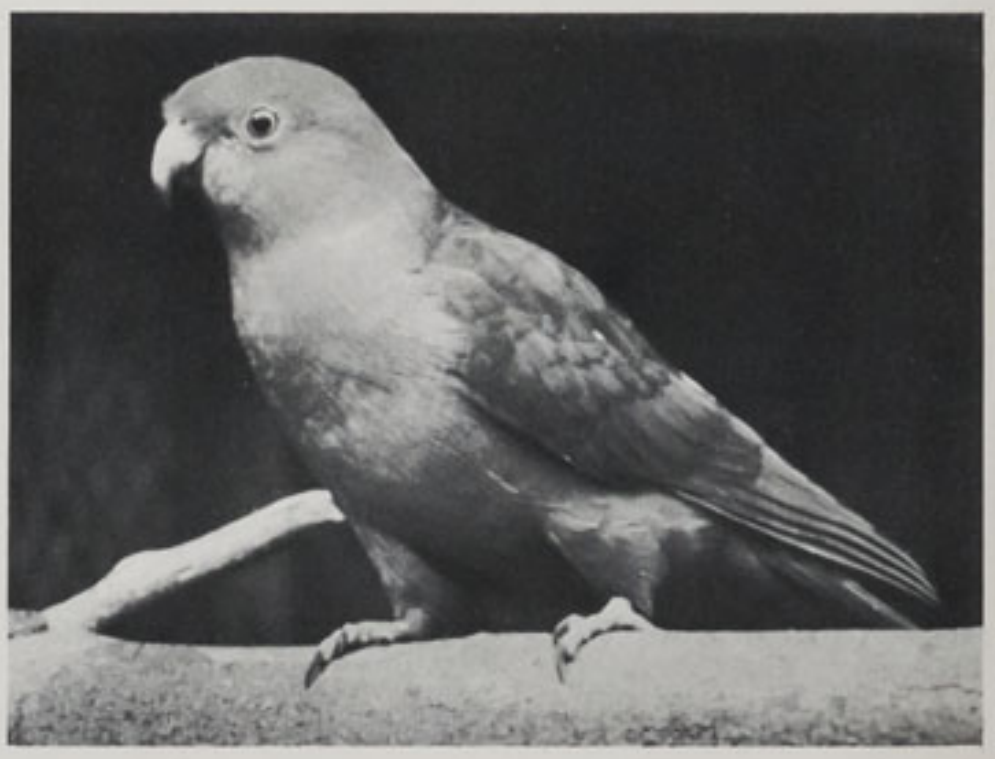


The South American freshwater sting ray *Potamotrygon* sp. in the Aquarium.

One of the two Californian Sealions that bred in 1984, with her pup ' Little Liz '.

Epiperipatus imthurni and its young, born in December — an unusual arrival in the Insect House.

Adult male African King Parrot: in 1984 the species was hatched for the first time at Whipsnade Park.



		1	2	3	4	5	6	7
Cynictis penicillata	Yellow Mongoose	3	—	—	—	—	—	1/2
Felis caracal	Caracal Lynx	2	—	1	1	—	—	1/1
Felis serval	Serval	2	—	2	2	—	—	1/1
Felis wiedi	Margay	5	—	1	—	2	—	2/1/1
Felis concolor	Puma	1	—	—	—	—	—	0/1
Panthera leo	Lion	4	—	1	1	—	—	2/2
Panthera tigris	Tiger (Sumatran form)	5	—	—	—	—	—	1/4
Panthera pardus	Leopard	5	—	2	1	—	1	3/2
Panthera onca	Jaguar	3	—	3	1	—	—	2/3
Acinonyx jubatus	Cheetah	2	—	—	—	—	—	1/1
PINNIPEDIA								
Zalophus californianus	Californian Sealion	4	—	2	—	—	—	2/4
Halichoerus grypus	Grey Seal	2	1	—	—	—	—	1/2
TUBULIDENTATA								
Orycteropus afer	Aardvark	3	—	1	1	—	—	1/2
PROBOSCIDEA								
Elephas maximus	Asian Elephant	1	—	—	—	—	—	0/1
HYRACOIDEA								
Procavia capensis	Rock Hyrax	3	8	—	—	2	—	4/5
PERISSODACTYLA								
*Equus przewalskii**	Przewalski's Horse	3	2(1)	—	—	—	3(2)	2/0
*Equus hemionus**	Onager (Turkmen form)	2	—	—	—	—	2	—
*Equus burchelli**	Common Zebra	3	—	—	—	—	—	1/2
*Equus zebra**	Hartmann's Mountain Zebra	2	—	—	—	—	2	—
Tapirus terrestris	Brazilian Tapir	2	—	1	—	—	—	1/2
Ceratotherium simum	White Rhinoceros	2	—	—	—	—	—	1/1
Diceros bicornis	Black Rhinoceros	3	—	—	—	—	1	1/1
ARTIODACTYLA								
Sus scrofa	Wild Boar	5	—	10	1	—	7	4/3
*Tayassu tajacu**	Collared Peccary	6	—	—	—	1	1	2/2
Choeropsis liberiensis	Pygmy Hippopotamus	2	—	1	—	1	—	1/1
*Lama glama**	Llama	3	—	—	—	—	—	3/0
*Lama guanicoe**	Guanaco	2	—	—	—	—	—	2/0
Lama pacos	Alpaca	—	1	—	—	—	—	1/0
Vicugna vicugna	Vicuna	3	1	—	—	—	—	2/2
Camelus bactrianus	Bactrian Camel	4	1	1	—	—	—	1/5
Muntiacus muntjak	Indian Muntjac	1	—	—	—	1	—	—
Muntiacus reevesi	Reeves's Muntjac	3	—	1	—	1	3	—
*Cervus timorensis**	Timor Deer	7	—	—	—	2	5	—
Pudu pudu	Pudu	6	—	2	—	1	1	4/2
Rangifer tarandus	Reindeer	3	—	1	—	—	—	1/3
Okapia johnstoni	Okapi	3	—	1	—	—	1	1/2
Giraffa camelopardalis	Giraffe	3	—	1	—	—	—	1/3
*Tragelaphus euryceros**	Bongo	3	—	1	—	1	—	1/2
*Tragelaphus strepsiceros**	Greater Kudu	7	—	4	—	3	—	4/4
*Bos gaurus**	Gaur	6	—	—	—	1	2	1/2
Bison bison	American Bison	2	—	1	—	—	—	2/1
*Hippotragus equinus**	Roan Antelope	6	—	3	—	1	2	1/5
*Oryx tao**	Scimitar-horned Oryx	2	—	—	—	—	—	2/0
*Oryx leucoryx**	Arabian Oryx	2	1	—	—	—	—	2/1
*Addax nasomaculatus**	Addax	4	—	1	—	—	1	2/2
*Antilope cervicapra**	Blackbuck	24	1	10	4	2	5(2)	4/20
Rupicapra rupicapra	Chamois	—	4	—	—	—	—	1/3
Capra falconeri	Markhor	9	—	6	1	3	—	4/7
Ammotragus lervia	Barbary Sheep	18	—	18	5	—	13	5/13
Ovis musimon	Mouflon	8	—	4	—	2	4	1/5
Ovis canadensis	Bighorn Sheep	6	—	3	1	1	—	3/4
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
DOMESTIC								
Pigs: Gloucester Old Spot		2	2	9	—	—	11	1/1
Miniature		3	—	13	4	—	9	1/2
Cattle: Friesian		3	—	3	1	—	2	0/3
Jersey		2	—	1	—	—	1	0/2
Goat: Common		6	—	10	2	—	9	0/5
Golden Guernsey		2	—	2	—	—	2	1/1
Nubian		1	—	—	—	—	—	0/1
Sheep: Dorset Down		11	—	7	1	—	8(2)	1/8
Black Welsh Mountain		1	—	—	—	—	—	1/0
Jacob's		1	—	—	—	—	—	1/0
Rabbit		32	12	150	29	11	118	6/9/21
Guineapig		37	1	12	—	14	24	1/11
Donkey		2	—	—	—	—	—	1/1
Pony: Cream		4	—	—	—	—	—	0/4
Shetland		2	—	—	—	—	1	0/1
Total-Mammals		1364	193(1)	843	107	403	619(6)	1271
Birds								
STRUTHIONIFORMES								
Struthio camelus	Ostrich	2	2	—	—	1	—	1/2
CASUARIIFORMES								
Casuarius bennetti	Bennett's Cassowary	1	—	—	—	—	—	0/1
Casuarius unappendiculatus	One-wattled Cassowary	1	—	—	—	—	—	1/0
Dromaius novaehollandiae	Emu	2	—	—	—	—	—	1/1
APTERYGIFORMES								
Apteryx australis mantelli	North Island Brown Kiwi	1	—	—	—	—	—	0/1
TINAMIFORMES								
Nothoprocta perdicaria	Chilean Tinamou	4	1	—	—	2	—	1/2
SPHENISCIFORMES								
Spheniscus demersus	Blackfooted Penguin	19	—	4	—	3	—	6/5/9
Spheniscus humboldti	Humboldt's Penguin	2	—	2	—	1	—	1/1/1
PELECANIFORMES								
Pelecanus onocrotalus	Eastern White Pelican	6	—	—	—	—	—	3/3
Pelecanus crispus	Crested Pelican	2	—	—	—	—	—	1/0/1
Pelecanus erythrorhynchos	American White Pelican	1	—	—	—	—	—	0/1
Pelecanus occidentalis	Brown Pelican	6	—	—	—	—	—	0/1/5
Morus bassanus	Gannet	2	1	—	—	—	—	0/0/3
Phalacrocorax carbo	Cormorant	5	—	—	—	—	—	2/1/2
Phalacrocorax aristotelis	Shag	3	—	—	—	—	—	3/0
CICONIIFORMES								
Nycticorax nycticorax	Night Heron	5	—	—	—	1	—	0/1/3
Ardeola ibis	Cattle Egret	8	—	1	—	—	—	1/4/4
Butorides striatus	Striated Heron	1	—	—	—	—	—	0/0/1
Ardea cinerea	Grey Heron	5	—	—	—	—	—	0/0/5
Ciconia abdimii	Abdim's Stork	16	—	4	—	1	—	4/4/11
Ciconia maguari	Maguari Stork	3	—	—	—	1	2	—
Ephippiorhynchus asiaticus	Black-necked Stork	2	—	—	—	—	—	1/1
Threskiornis aethiopicus	Sacred Ibis	32	—	5	1	4	—	3/3/26
Carphibis spinicollis	Straw-necked Ibis	3	—	—	—	—	—	1/1/1
Eudocimus albus	White Ibis	9	—	—	—	2	—	1/2/4
Eudocimus ruber	Scarlet Ibis	10	—	—	—	1	—	5/4
Platalea leucorodia	Spoonbill	1	—	—	—	1	—	—
Phoenicopterus ruber roseus	Greater Flamingo	10	—	—	—	—	—	0/0/10
Phoenicopterus ruber ruber	Rosy Flamingo	17	—	—	—	—	—	5/2/10
Phoenicopterus chilensis	Chilean Flamingo	38	—	5	—	1	—	9/7/26
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
ANSERIFORMES								
Dendrocygna bicolor	Fulvous Whistling Duck	4	—	—	—	1	—	2/1
Dendrocygna viduata	White-faced Tree Duck	—	10	—	—	—	—	5/5
Dendrocygna arborea	Cuban Tree Duck	2	—	—	—	—	—	1/1
Dendrocygna autumnalis	Red-billed Whistling Duck	5	—	—	—	1	—	3/1
Anser caerulescens atlanticus	Greater Snow Goose	3	—	—	—	1	—	1/1
Anser canagicus	Emperor Goose	2	—	—	—	—	—	1/1
Branta sandvicensis	Hawaiian Goose	5	—	5	—	1	1	3/2/3
Branta leucopsis	Barnacle Goose	6	—	—	—	—	—	3/3
Branta bernicla orientalis	Brent Goose	7	—	3	—	1	—	4/2/3
Branta ruficollis	Red-breasted Goose	2	—	—	—	—	—	1/1
Cereopsis novaehollandiae	Cape Barren Goose	3	—	—	—	—	—	1/1/1
Tadorna tadorna	Shelduck	1	—	—	—	—	—	1/0
Aix sponsa	Carolina Duck	5	1	—	—	1	—	3/2
Aix galericulata	Mandarin Duck	8	—	—	—	1	1	4/2
Callonetta leucophrys	Ringed Teal	17	—	1	—	8	—	5/5
Chenonetta jubata	Maned Goose	2	—	—	—	—	—	1/1
Anas penelope	Wigeon	10	—	—	—	—	—	7/3
Anas sibilatrix	Chiloe Wigeon	15	—	2	—	1	—	10/5/1
Anas strepera	Gadwall	3	—	—	—	—	—	1/2
Anas crecca	Teal	5	—	—	—	2	—	1/2
Anas flavirostris oxyptera	Sharp-winged Teal	2	—	—	—	—	—	1/1
Anas platyrhynchus laysanensis	Laysan Duck	2	1	—	—	1	—	1/1
Anas acuta	Pintail	7	1	—	—	1	—	5/2
Anas bahamensis	Bahama Pintail	1	—	—	—	—	—	0/0/1
Anas versicolor puna	Puna Teal	4	—	—	—	—	—	2/2
Anas querquedula	Garganey	6	—	7	—	2	6(6)	4/1
Anas clypeata	Shoveler	3	1	—	—	—	—	2/2
Marmaronetta angustirostris	Marbled Teal	6	—	—	—	—	2	3/1
Netta rufina	Red-crested Pochard	3	1	—	—	—	—	2/2
Aythya valisineria	Canvasback	4	—	—	—	—	—	2/2
Aythya ferina	European Pochard	3	—	—	—	—	—	2/1
Aythya fuligula	Tufted Duck	6	—	—	—	—	—	3/3
Somateria mollissima	Eider Duck	9	—	3	—	1	—	6/5
Bucephala clangula	Goldeneye	2	—	—	—	—	—	1/1
Mergus merganser	Goosander	1	1	—	—	—	—	1/1
Oxyura jamaicensis	North American Ruddy Duck	7	—	—	—	1	1	2/3
FALCONIFORMES								
Vultur gryphus	Andean Condor	4	—	—	—	—	—	2/2
Milvus migrans migrans	Black Kite	1	—	—	—	—	—	1/0
Milvus migrans parasitus	African Black Kite	1	—	—	—	—	—	0/1
Haliastur indus	Brahminy Kite	1	—	—	—	—	—	0/1
Haliastur indus intermedius	Javan Brahminy Kite	1	—	—	—	—	—	1/0
Haliaeetus vocifer	Fish Eagle	1	—	—	—	—	—	0/1
Neophron percnopterus percnopterus	Egyptian Vulture	2	—	—	—	—	—	1/1
Gyps fulvus	Griffon Vulture	2	—	—	—	—	—	0/0/2
Torgus tracheliotus	Lappet-faced Vulture	1	—	—	—	—	—	0/1
Circaetus gallicus gallicus	Short-toed Eagle	1	—	—	—	—	—	0/1
Terathopius ecaudatus	Bateleur Eagle	2	—	1	—	—	—	1/1/1
Spilornis cheela ricketti	Chinese Serpent Eagle	1	—	—	—	—	—	1/0
Polyboroides typus	Harrier Hawk	2	—	—	—	—	—	1/1
Butastur rufipennis	Grasshopper Buzzard	1	—	—	—	—	—	0/1
Heterospizias meridionalis	Savannah Hawk	1	—	—	—	—	—	1/0
Geranoaetus melanoleucus	Grey Eagle-buzzard	1	—	—	—	—	—	1/0
Buteo buteo	Buzzard	2	—	—	—	—	—	1/1
Buteo rufinus	Long-legged Buzzard	2	—	—	—	—	—	1/1
Aquila rapax	Tawny Eagle	2	—	—	—	—	—	1/1
Aquila rapax orientalis	Western Steppe Eagle	1	—	—	—	—	—	1/0
Aquila heliaca	Imperial Eagle	1	—	—	—	—	—	0/1
Aquila wahlbergi	Wahlberg's Eagle	1	—	—	—	—	—	0/0/1
Aquila chrysaetos	Golden Eagle	1	—	—	—	—	—	1/0
Polyborus plancus plancus	Common Caracara	2	—	—	—	—	—	2/0
Polyborus plancus cheriway	Cheriway Carrion Hawk	1	—	—	—	1	—	—
Falco cenchroides	Nankeen Kestrel	1	—	—	—	1	—	—
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
GALLIFORMES								
Penelope purpurascens	Crested Guan	2	—	—	—	—	—	1/1
Crax alector	Black Curassow	2	—	—	—	—	—	1/1
Lophortyx californica	Californian Quail	2	—	—	—	1	—	1/0
Lophortyx gambelii	Gambel's Quail	1	—	—	—	—	—	1/0
Colinus virginianus	Bobwhite Quail	1	—	—	—	1	—	—
Alectoris rufa	Red-legged Partridge	4	—	3	—	—	5	1/1
Coturnix delegorguei	Harlequin Quail	3	—	—	—	—	—	2/1
Excalfactoria chinensis	Chinese Painted Quail	1	—	—	—	—	—	1/0
Rollulus roulroul	Crested Wood Partridge	3	—	—	—	—	—	2/1
Bambusicola thoracica	Chinese Bamboo Partridge	—	2	3	—	—	3	1/1
Tragopan satyra	Satyr Tragopan	2	—	—	—	—	—	1/1
Pucrasia macrolopha	Koklass Pheasant	2	1	6	—	5	2	1/1
Lophophorus impeyanus	Impeyan Pheasant	2	1	—	—	—	1	1/1
Gallus sonneratii	Sonnerat's Jungle Fowl	3	1(1)	9	—	3	7(7)	1/2
Lophura leucomelana leucomelana	Nepal Kalij Pheasant	2	1	—	—	1	—	1/1
Lophura nycthemera	Silver Pheasant	2	—	—	—	—	—	1/1
Lophura imperialis	Imperial Pheasant	5	—	—	—	1	—	4/0
Lophura swinhoii	Swinhoe's Pheasant	2	—	1	—	—	1	1/1
Lophura ignita ignita	Bornean Crested Fireback	1	1	—	—	—	—	1/1
Lophura diardi	Siamese Fire-back Pheasant	2	1	—	—	1	—	1/1
Crossoptilon crossoptilon	White Eared Pheasant	2	—	—	—	2	—	—
Crossoptilon auritum	Blue Eared Pheasant	2	—	2	—	—	2	1/1
Catreus wallichi	Cheer Pheasant	2	—	5	—	2	3	1/1
Syrmaticus ellioti	Elliot's Pheasant	2	1	—	—	1	—	1/1
Syrmaticus humiae	Hume's Bar-tailed Pheasant	2	—	2	—	—	2	1/1
Syrmaticus mikado	Mikado Pheasant	4	—	9	—	2	9	1/1
Syrmaticus soemmerringi scintillans	Scintillating Copper Pheasant	2	—	5	—	—	5	1/1
Syrmaticus reevesi	Reeves's Pheasant	1	1	—	—	—	—	1/1
Phasianus colchicus	Common Pheasant	1	—	—	—	1	—	—
Chrysolophus pictus	Golden Pheasant	4	—	—	—	—	—	3/1
Polyplectron chalcurum	Bronze-tailed Peacock Pheasant	—	3	1	—	1	1	1/1
Polyplectron bicalcaratum	Grey Peacock Pheasant	2	—	6	—	—	4	1/1/2
Pavo cristatus	Common Peafowl	2	—	—	—	—	—	1/1
Afropavo congensis	Congo Peafowl	—	4	—	—	—	—	2/2
Acryllium vulturinum	Vulturine Guineafowl	4	1	1	—	1	—	1/3/1
GRUIFORMES								
Grus antigone	Sarus Crane	3	—	2	2	—	—	1/2
Grus rubicunda	Brolga	1	—	—	—	—	—	0/0/1
Anthropoides virgo	Demoiselle Crane	8	—	—	—	2	—	3/3
Anthropoides paradisea	Stanley Crane	2	—	—	—	—	—	1/1
Balearica pavonina	West African Crowned Crane	2	—	—	—	—	—	1/1
Balearica regulorum	South African Crowned Crane	11	—	9	3	2	—	2/2/11
Aramides cajanea × *A. axillaris*	Hybrid Cayenne Wood Rail × Venezuelan Wood Rail	1	—	—	—	1	—	—
Porphyrula alleni	Allen's Gallinule	1	—	—	—	—	—	0/0/1
Porphyrio porphyrio poliocephalus	Grey-headed Gallinule	3	—	—	—	—	—	1/1/1
Lissotis melanogaster melanogaster	Black-bellied Bustard	1	—	—	—	—	—	0/1
CHARADRIIFORMES								
Laterallus leucopyrrhus	White-breasted Crake	—	2	—	—	—	—	0/0/2
Haematopus ostralegus	Oystercatcher	7	—	1	—	1	2	2/2/1
Himantopus himantopus	Black-winged Stilt	1	—	—	—	—	—	0/0/1
Recurvirostra avosetta	Avocet	1	8	—	—	1	—	4/3/1
Burhinus oedicnemus	Stone Curlew	4	4	2	1	—	1	3/3/2
Glareola pratincola	Collared Pratincole	1	—	—	—	—	—	0/0/1
Vanellus vanellus	Lapwing	2	—	—	—	1	—	0/0/1
Pluvialis squatarola	Grey Plover	—	1	—	—	—	—	0/0/1
Charadrius hiaticula	Ringed Plover	1	—	—	—	—	—	0/0/1
Numenius arquata	Curlew	3	—	—	—	1	—	1/0/1
Tringa totanus	Redshank	—	1	—	—	—	—	0/0/1
Arenaria interpres	Turnstone	—	2	—	—	—	—	0/0/2
Philomachus pugnax	Ruff	7	—	1	—	—	—	4/4
Catharacta skua antarctica	Antarctic Skua	2	—	—	—	—	—	1/1
Larus cirrocephalus poiocephalus	Grey-headed Gull	21	—	16	—	—	14	7/7/9
Larus novaehollandiae	Silver Gull	2	—	—	—	—	—	0/1/1
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
Larosterna inca	Inca Tern	1	2	—	—	—	—	0/0/3
Alca torda	Razorbill	1	—	—	—	1	—	—
Uria aalge	Guillemot	3	—	—	—	—	—	0/1/2
COLUMBIFORMES								
Columba livia	Rock Dove	1	—	—	—	—	—	0/0/1
Columba guinea	Speckled Pigeon	20	—	21	—	5	1	3/3/29
Columba picazuro	Picazuro Pigeon	4	—	—	—	—	2	1/1
Streptopelia roseogrisea	Pink-headed Pigeon	2	—	—	—	—	2	—
Streptopelia capicola	Ring-necked Dove	1	—	—	—	—	1	—
Streptopelia tranquebarica humilis	Dwarf Turtle Dove	2	—	—	—	—	—	2/0
Streptopelia chinensis chinensis	Chinese Necklace Dove	7	—	—	—	2	—	1/1/3
Phaps elegans	Brush Bronzewing	3	—	—	—	1	—	1/1
Ochyphaps lophotes	Crested Pigeon	2	2	—	—	—	—	1/1/2
Geopelia cuneata	Diamond Dove	1	2	—	—	—	1	1/0/1
Zenaida auriculata	Violet-eared Dove	3	—	—	—	—	—	2/1
Geotrygon versicolor	Mountain Witch Dove	5	—	—	—	2	—	0/1/2
Gallicolumba luzonica	Blood-breasted Pigeon	2	—	—	—	—	—	0/0/2
Ducula badia cuprea	Jerdon's Imperial Pigeon	6	—	—	—	—	—	1/0/5
Ducula bicolor	Pied Imperial Pigeon	1	—	—	—	—	—	0/0/1
PSITTACIFORMES								
Pseudeos fuscata	Dusky Lory	2	—	—	—	1	—	0/1
Trichoglossus euteles	Perfect Lorikeet	2	—	—	—	—	—	1/1
Lorius garrulus × *L. domicellus*	Scarlet Lory × Purple-capped Lory	1	—	—	—	—	—	0/0/1
Lorius garrulus flavopalliatus	Yellow-backed Lory	1	—	—	—	—	—	0/0/1
Probosciger aterrimus aterrimus	Aru Islands Palm Cockatoo	1	—	—	—	1	—	—
Calyptorhynchus funereus	Funereal Cockatoo	1	—	—	—	—	—	0/1
Callocephalon fimbriatum	Gang Gang Cockatoo	1	—	—	—	—	—	1/0
Eolophus roseicapillus	Roseate Cockatoo	2	—	—	—	—	—	1/1
Cacatua leadbeateri	Leadbeater's Cockatoo	2	—	—	—	—	—	1/1
Cacatua sulphurea	Lesser Sulphur-crested Cockatoo	2	—	—	—	—	1	1/0
Cacatua galerita galerita	Greater Sulphur-crested Cockatoo	1	—	—	—	—	1(1)	—
Cacatua moluccensis	Moluccan Cockatoo	2	—	—	—	—	—	1/1
Cacatua sanguinea sanguinea	Bare-eyed Cockatoo	2	—	—	—	—	—	1/1
Cacatua tenuirostris pastinator	Western Slender-billed Cockatoo	3	—	—	—	—	—	2/1
Nymphicus hollandicus	Cockatiel	21	2	—	—	2	6	4/1/10
Nestor notabilis	Kea	4	—	—	—	1	—	1/2
Eclectus roratus	Eclectus Parrot	2	—	—	—	—	—	1/1
Polytelis swainsoni	Barraband Parrakeet	7	—	—	—	3	1	2/0/1
Polytelis anthopeplus	Rock Peplar	11	—	5	—	4	—	2/3/7
Polytelis alexandrae	Princess of Wales Parrakeet	4	—	—	—	—	—	2/2
Platycercus eximius eximius	Eastern Rosella Parrakeet	4	—	—	—	—	—	3/1
Psephotus haematonotus	Red-rumped Parrakeet	1	1(1)	—	—	—	—	1/1
Neophema bourkii	Bourke's Parrakeet	2	—	—	—	—	—	1/1
Neophema chrysostomus	Blue-winged Grass Parakeet	2	—	—	—	—	—	1/1
Neophema splendida	Splendid Grass Parrakeet	2	—	2	—	—	2	1/1
Coracopsis vasa	Vasa Parrot	1	—	—	—	—	—	0/1
Psittacus erithacus	Grey Parrot	6	—	—	—	—	—	2/2/2
Poicephalus robustus suahelicus	Cape Parrot	1	—	—	—	—	—	1/0
Poicephalus cryptoxanthus cryptoxanthus	Southern Brown-headed Parrot	2	—	—	—	—	—	0/0/2
Poicephalus senegalus versteri	Orange-bellied Senegal Parrot	1	—	—	—	—	—	1/0
Poicephalus rueppellii	Ruppell's Parrot	4	—	3	—	—	4	1/1/1
Agapornis fischeri	Fischer's Lovebird	27	2	—	—	4	5	7/7/6
Loriculus vernalis	Vernal Hanging Parrot	2	—	—	—	—	—	1/1
Loriculus galgulus	Blue-crowned Hanging Parrot	1	—	—	—	—	—	1/0
Psittacula eupatria nipalensis	Alexandrine Parrakeet	3	—	—	—	—	1(1)	1/1
Psittacula krameri krameri	African Ring-necked Parrakeet	1	—	—	—	—	—	1/0
Psittacula krameri manillensis	Indian Ring-necked Parrakeet	4	—	3	—	—	—	3/1/3
Psittacula cyanocephala	Plum-headed Parrakeet	2	—	—	—	—	—	1/1
Psittacula alexandri alexandri	Javan Parrakeet	1	—	—	—	1	—	—
Anodorhynchus hyacinthinus	Hyacinthine Macaw	4	—	—	—	—	—	1/3
Ara ararauna	Blue and Yellow Macaw	2	—	—	—	—	—	1/1
Ara ambigua	Buffon's Macaw	2	—	—	—	—	—	1/1
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
Ara macao	Scarlet Macaw	2	—	—	—	—	—	1/1
Ara chloroptera	Green-winged Macaw	3	—	—	—	—	—	2/1
Ara severa severa	Severe Macaw	1	1	—	—	—	—	1/1
Aratinga erythrogenys	Red-masked Conure	2	—	—	—	—	1	0/1
Aratinga solstitialis	Sun Conure	4	—	—	—	—	—	3/1
Rhynchopsitta pachyrhyncha	Thick-billed Parrot	2	—	—	—	—	—	1/1
Cyanoliseus patagonus byroni	Greater Patagonian Conure	4	1	—	—	1	—	2/2
Pyrrhura frontalis	Red-bellied Conure	1	—	—	—	—	—	0/1
Myiopsitta monachus	Quaker Parrakeet	1	—	—	—	—	—	0/0/1
Brotogeris versicolurus chiriri	Canary-winged Parrakeet	2	—	—	—	—	—	1/0/1
Brotogeris pyrrhopterus	Orange-flanked Parrakeet	3	—	—	—	—	—	1/1/1
Pionites melanocephala	Black-headed Caique	1	—	—	—	1	—	—
Amazona albifrons	White-browed Amazon Parrot	1	—	—	—	1	—	—
Amazona festiva	Festive Amazon Parrot	2	—	—	—	—	—	1/1
Amazona ochrocephala	Yellow-fronted Amazon Parrot	1	—	—	—	—	—	0/0/1
Amazona amazonica	Orange-winged Amazon Parrot	2	—	—	—	—	—	1/1
CUCULIFORMES								
Tauraco corythaix corythaix	Knysna Turaco	1	—	—	—	—	—	1/0
Tauraco erythrolophus	Red-crested Turaco	3	—	—	—	—	—	1/2
Tauraco hartlaubi	Hartlaub's Turaco	2	—	—	—	—	—	2/0
Tauraco leucotis	White-cheeked Turaco	11	—	—	—	1	3	1/2/4
Eudynamys scolopacea chinensis	Chinese Koel	1	—	—	—	—	—	0/0/1
STRIGIFORMES								
Tyto alba	Barn Owl	2	—	7	—	—	7	1/1
Otus leucotis	White-faced Scops Owl	3	—	1	—	1	—	0/2/1
Bubo virginianus	Great Horned Eagle Owl	2	—	—	—	—	—	1/1
Bubo bubo bubo	European Eagle Owl	2	—	—	—	—	—	1/1
Bubo bubo turcomanus	Turkmenian Eagle Owl	2	—	—	—	—	—	1/1
Bubo bubo bengalensis	Indian Eagle Owl	2	—	—	—	—	—	0/2
Bubo capensis mackinderi	Kenya Eagle Owl	2	—	—	—	—	—	1/1
Bubo africanus africanus	Spotted Eagle Owl	2	—	—	—	—	—	1/1
Bubo africanus cinerascens	Abyssinian Spotted Eagle Owl	5	—	3	—	—	3	2/2/1
Bubo poensis	Fraser's Eagle Owl	2	—	—	—	1	—	1/0
Bubo vosseleri	Nduk Eagle Owl	3	—	—	—	—	—	1/2
Ketupa zeylonensis	Brown Fish Owl	1	—	—	—	—	—	1/0
Ketupa ketupu	Javan Fish Owl	3	—	—	—	—	—	0/3
Scotopelia bouvieri	Vermiculated Fishing Owl	2	—	—	—	—	—	1/1
Pulsatrix perspicillata	Spectacled Owl	3	—	—	—	—	1	1/1
Nyctea scandiaca	Snowy Owl	2	—	3	—	—	3(1)	1/1
Ninox novaeseelandiae	Boobook Owl	5	—	4	—	—	5	2/2
Athene noctua	Little Owl	2	—	5	—	—	5	1/1
Athene brama	Spotted Owlet	4	—	—	—	—	—	2/2
Speotyto cunicularia	Burrowing Owl	3	—	—	—	2	—	1/0
Ciccaba woodfordii	African Wood Owl	3	2	—	—	—	1	1/2/1
Strix aluco sylvatica	Tawny Owl	2	—	4	—	—	4	1/1
Strix hylophila	Rusty Barred Owl	2	—	—	—	—	—	1/1
Asio otus	Long-eared owl	2	—	—	—	—	—	1/1
Asio flammeus	Short-eared Owl	1	2	—	—	1	—	1/1
APODIFORMES								
Polytmus theresiae	Green-tailed Golden-throat Hummingbird	1	—	—	—	1	—	—
Thalurania furcata furcata	Fork-tailed Woodnymph	1	—	—	—	1	—	—
Amazilia amazilia S (Lesson)	Amazilia Hummingbird	—	2	—	—	—	—	0/0/2
CORACIIFORMES								
Dacelo novaeguinea	Kookaburra	2	—	—	—	—	—	1/1
Momotus momota	Blue-crowned Motmot	5	—	—	—	—	1	2/2
Coracias caudata	Lilac-breasted Roller	1	—	—	—	—	—	0/0/1
Tockus alboterminatus	Crowned Hornbill	2	—	—	—	—	—	0/2
Tockus erythrorhynchus	Red-billed Hornbill	4	—	—	—	—	—	2/2
Tockus deckeni jacksoni	Jackson's Hornbill	1	—	—	—	—	—	1/0
Penelopides panini	Tarictic Hornbill	9	—	—	—	2	—	2/5
Aceros undulatus	Wreathed Hornbill	2	—	—	—	—	—	0/2
Anthracoceros malayanus	Black Hornbill	2	—	—	—	—	—	0/2
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
Anthracoceros coronatus convexus	Southern Pied Hornbill	1	—	—	—	—	—	0/1
Bycanistes bucinator	Trumpeter Hornbill	2	—	—	—	1	—	1/0
Bycanistes subcylindricus	Black and White Casqued Hornbill	2	—	—	—	—	—	1/1
Buceros bicornis	Great Indian Hornbill	2	—	—	—	—	—	1/1
Buceros hydrocorax	Rufous Hornbill	3	—	—	—	—	1	1/1
PICIFORMES								
Tricholaema lacrymosum	Spotted-flanked Barbet	1	—	—	—	—	—	1/0
Lybius guifsobalito	Black-billed Barbet	1	—	—	—	—	—	0/1
Lybius bidentatus	Double-toothed Barbet	2	—	—	—	—	—	0/1/1
Trachyphonus darnaudii	D'Arnaud's Barbet	1	—	—	—	—	—	0/1
Pteroglossus torquatus	Chestnut-eared Aracari	—	1	—	—	—	—	0/0/1
Andigena laminirostris	Laminated Hill Toucan	1	—	—	—	—	—	0/1
Ramphastos vitellinus ariel	Ariel Toucan	1	—	—	—	—	—	1/0
Ramphastos vitellinus vitellinus	Yellow-ridged Toucan	1	—	—	—	—	—	1/0
Ramphastos tucanus	Red-billed Toucan	—	2	—	—	—	—	1/1
Ramphastos swainsonii	Swainson's Toucan	2	—	—	—	—	—	0/2
Melanerpes candidus	White Woodpecker	1	2	—	—	—	—	2/1
PASSERIFORMES								
Procnias nudicollis	Naked-throated Bellbird	1	—	—	—	—	—	1/0
Pitta guajana	Banded Pitta	1	—	—	—	1	—	—
Motacilla alba	Pied Wagtail	1	—	—	—	—	—	0/0/1
Pycnonotus leucogenys	White-eared Bulbul	1	—	—	—	—	—	0/0/1
Pycnonotus cafer bengalensis	Red-vented Bulbul	2	—	—	—	—	—	0/0/2
Hypsipetes madagascariensis	Black Bulbul	3	—	1	1	—	—	1/1/1
Chloropsis aurifrons	Golden-fronted Leafbird	2	—	—	—	—	—	1/1
Irena puella	Fairy Bluebird	3	1	—	—	—	—	2/2
Copsychus malabaricus indicus	White-rumped Shama	1	—	—	—	—	—	1/0
Turdus olivaceus	African Thrush	4	—	3	1	—	—	1/1/4
Turdus pilaris	Fieldfare	1	—	—	—	—	—	0/0/1
Turdoides striatus	Jungle Babbler	1	—	—	—	—	—	0/0/1
Garrulax albogularis	White-throated Jay Thrush	1	—	—	—	—	—	0/0/1
Garrulax leucolophus	White-crested Laughing Thrush	5	—	—	—	1	—	0/0/4
Garrulax pectoralis	Necklaced Laughing Thrush	5	—	—	—	1	3	0/0/1
Garrulax chinensis	Black-throated Laughing Thrush	4	—	—	—	1	—	2/1
Garrulax cineraceus	Moustached Laughing Thrush	2	—	—	—	—	—	1/1
Garrulax poecilorhynchus	Rufous Laughing Thrush	1	—	—	—	—	—	0/0/1
Garrulax mitratus	Chestnut-capped Laughing Thrush	1	—	—	—	1	—	—
Garrulax canorus	Melodious Jay Thrush	1	—	—	—	—	—	0/0/1
Leiothrix lutea	Pekin Robin	5	—	—	—	—	1	1/1/2
Malurus cyaneus	Superb Blue Wren	2	—	—	—	—	—	1/1
Malurus splendens	Splendid Fairy Wren	1	—	—	—	—	—	1/0
Ficedula cyanomelana	Blue and White Flycatcher	1	1	—	—	2	—	—
Zosterops palpebrosa	Oriental White-eye	1	—	—	—	—	—	0/0/1
Zosterops flava	Javan White-eye	6	—	—	—	1	—	1/1/3
Emberiza rutila	Chestnut Bunting	—	2	—	—	1	—	1/0
Gubernatrix cristata	Green Cardinal	1	—	—	—	—	—	0/1
Paroaria coronata	Red-crested Cardinal	2	—	—	—	—	—	1/1
Passerina caerulea	Blue Grosbeak	1	—	—	—	1	—	—
Tachyphonus rufus	Black Tanager	1	—	—	—	—	—	1/0
Ramphocelus nigrogularis	Masked Crimson Tanager	1	—	—	—	—	—	1/0
Ramphocelus carbo	Silver-beaked Tanager	1	1	—	—	—	—	1/1
Ramphocelus flammigerus icteronotus	Lemon-rumped Tanager	2	—	—	—	—	—	1/1
Thraupis episcopus	Blue Grey Tanager	2	—	—	—	—	—	0/0/2
Cyanerpes caeruleus	Purple Honeycreeper	1	—	—	—	—	—	0/1
Cyanerpes cyaneus	Red-legged Honeycreeper	1	1	—	—	—	—	1/1
Cacicus melanicterus	Mexican Cacique	1	—	—	—	—	—	0/1
Molothrus bonariensis	Shiny Cowbird	3	—	—	—	—	—	3/0
Fringilla coelebs	Chaffinch	1	—	—	—	—	—	0/1
Carduelis chloris	Greenfinch	6	—	—	—	—	—	0/1/5
Carduelis carduelis	Goldfinch	1	—	—	—	—	—	0/0/1
Acanthis flammea	Redpoll	2	—	—	—	—	—	1/1
Acanthis cannabina	Linnet	1	—	—	—	—	—	0/0/1
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
Pyrrhula pyrrhula	Bullfinch	1	—	—	—	—	1	—
Pyrenestes ostrinus	Black-bellied Seedcracker	2	—	—	—	2	—	—
Estrilda melpoda	Orange-cheeked Waxbill	1	2	—	—	1	—	0/0/2
Estrilda troglodytes	Red-eared Waxbill	2	—	—	—	1	—	0/1
Amandava amandava	Avadavat	1	—	—	—	—	—	1/0
Amandava subflava	Golden-breasted Waxbill	1	2	—	—	—	—	0/1/2
Poephila guttata	Zebra Finch	20	—	6	—	—	12	5/5/4
Poephila bichenovii	Bicheno's Finch	1	—	—	—	1	—	—
Lonchura maja	White-headed Mannikin	1	2	—	—	1	—	0/0/2
Padda oryzivora	Java Sparrow	—	7	—	—	3	—	0/0/4
Amandina fasciata	Cut-throat Finch	1	1	—	—	1	—	0/0/1
Sp. inc.	Weaver	7	—	—	—	4	2	0/0/1
Ploceus cucullatus	Spotted-backed Weaver	1	—	—	—	—	—	1/0
Quelea quelea	Red-beaked Weaver	2	—	—	—	1	—	0/0/1
Euplectes albonotatus	White-winged Whydah	1	—	—	—	—	—	0/1
Lamprotornis purpureus	Purple Glossy Starling	5	1	—	—	—	—	0/0/6
Lamprotornis chalybaeus	Green Glossy Starling	5	—	—	—	1	—	0/0/4
Spreo superbus	Superb Glossy Starling	5	5	—	—	—	1	1/2/6
Creatophora cinerea	Wattled Starling	12	—	—	—	2	—	4/4/2
Sturnus pagodarum	Pagoda Starling	1	—	—	—	—	—	0/0/1
Sturnus sericeus	Silky Starling	1	—	—	—	1	—	—
Sturnus vulgaris	Common Starling	1	—	—	—	—	—	1/0
Leucopsar rothschildi	Rothschild's Grackle	9	—	—	—	1	—	5/3
Acridotheres cristatellus cristatellus	Chinese Crested Mynah	1	—	—	—	—	—	0/0/1
Gracula religiosa intermedia	Nepal Hill Mynah	2	2	—	—	—	—	1/0/3
Struthidea cinerea	Grey Struthidea	2	—	—	—	—	—	0/1/1
Garrulus glandarius	Jay	2	—	—	—	—	—	0/0/2
Pica pica pica	Magpie	2	—	—	—	1	—	0/0/1
Pyrrhocorax graculus	Alpine Chough	2	—	—	—	—	—	0/0/2
Corvus frugilegus	Rook	1	—	—	—	—	—	0/0/1
Corvus corone corone	Carrion Crow	2	—	—	—	—	—	0/0/2
Corvus corone cornix	Hooded Crow	1	—	—	—	—	—	0/0/1
Corvus corax corax	Raven	2	—	—	—	—	—	1/1
Corvus albicollis	White-necked Raven	2	—	—	—	—	—	1/1
DOMESTIC								
	Common Duck	5	—	—	—	1	—	1/3
	Silky Bantam	4	—	1	—	—	2	1/2
	Brahma Chicken	3	—	—	—	—	2	1/0
	Domestic Pigeon	4	—	—	—	—	4	—
	Total-Birds	1158	108(2)	199	9	151	166(16)	1139

Reptiles

TESTUDINES								
Sternotherus odoratus	Stinkpot	6	1	—	—	—	—	1/2/4
Kinosternon subrubrum	Eastern Mud Terrapin	1	—	—	—	—	—	0/0/1
Kinosternon scorpioides	Scorpion Mud Terrapin	2	—	—	—	—	—	1/0/1
Chrysemys picta dorsalis	Southern Painted Terrapin	—	1	—	—	—	1	—
Chrysemys scripta dorbignyi	South American Ornate Terrapin	2	—	—	—	—	—	0/2
Chrysemys scripta elegans	Red-cared Terrapin	3	2	—	—	—	—	1/2/2
Graptemys kohnii	Mississippi Map Terrapin	—	1	—	—	—	1	—
Mauremys caspica leprosa	Spanish Terrapin	1	—	—	—	—	—	0/1
Clemmys insculpta	Wood Terrapin	2	—	—	—	1	—	1/0
Emys orbicularis	European Pond Tortoise	3	—	—	—	—	—	2/1
Terrapene carolina	Carolina Box Terrapin	1	—	—	—	—	—	0/1
Terrapene carolina triunguis	Three-toed Box Tortoise	2	—	—	—	—	—	1/1
Testudo graeca	Spur-thighed Tortoise	—	3	—	—	—	—	1/2
Testudo hermanni	Hermann's Tortoise	—	2	—	—	—	—	0/2
Geochelone gigantea gigantea	Aldabra Giant Tortoise	5	—	—	—	—	—	2/3
Geochelone elephantopus elephantopus	South Albemarle Giant Tortoise	1	—	—	—	—	—	0/1
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
Geochelone carbonaria	Red-footed Tortoise	2	—	—	—	—	—	1/1
Chelonia mydas	Green Turtle	3	—	—	—	—	3	—
Eretmochelys imbricata	Hawksbill Turtle	2	—	—	—	1	—	0/0/1
Caretta caretta	Loggerhead Turtle	1	—	—	—	—	1	—
Chelus fimbriatus	Matamata	3	—	—	—	1	—	0/2
Trionyx hurum	Peacock Soft-shelled Turtle	2	—	—	—	—	—	1/1
Trionyx sinensis	Chinese Soft-shelled Turtle	—	2	—	—	—	—	1/1
CROCODYLIA								
Osteolaemus tetraspis tetraspis	West African Dwarf Crocodile	6	—	—	—	—	6	—
Alligator mississippiensis	American Alligator	3	—	—	—	—	—	1/2
Alligator sinensis	Chinese Alligator	3	—	—	—	—	—	1/2
SAURIA								
Sp. inc.	Gecko	—	2	—	—	—	—	0/0/2
Hemitheconyx caudicinctus	Fat-tailed Gecko	5	1	6	1	—	—	3/2/6
Chondrodactylus angulifer G (Peters)	Namib Sand Gecko	—	14	—	—	1	—	0/0/13
Diplodactylus ciliaris	Spiny-tailed Gecko	3	—	—	—	—	—	1/2
Gekko gecko	Tokay Gecko	2	—	—	—	—	—	1/1
Ptychozoon kuhli	Flying Gecko	3	—	—	—	2	—	1/0
Tarentola mauritanica	Moorish Gecko	—	1	—	—	—	—	0/0/1
Phelsuma cepedianum	Jewel Gecko	7	—	9	5	4	—	2/3/2
Eublepharis macularius	Leopard Ground Gecko	23	—	97	1	5	91	6/9/8
Anolis richardii	Richard's Anole	12	—	10	—	6	6	0/0/10
Anolis carolinensis	Green Anole	13	—	—	—	3	10	—
Laemanctus longipes deborrei	Casque-headed Lizard	1	—	—	—	—	—	0/1
Basiliscus vittatus	Banded Basilisk	5	—	3	—	1	—	2/1/4
Basiliscus plumifrons	Plumed Basilisk	5	3	2	—	3	—	2/4/1
Cyclura cornuta	Rhinoceros Iguana	8	—	—	—	1	2	3/2
Iguana iguana	Common Iguana	2	—	—	—	—	—	1/1
Dipsosaurus dorsalis	Desert Iguana	3	—	—	—	1	—	2/0
Sauromalus obesus	Chuckwalla	8	—	—	—	1	—	3/3/1
Sceloporus poinsetti	Crevice Spiny Lizard	1	—	—	—	—	—	1/0
Sceloporus orcutti	Granite Spiny Lizard	1	—	—	—	—	—	1/0
Amphibolurus vitticeps	Inland Bearded Dragon	5	—	—	—	1	—	4/0
Physignathus lesueurii	Lesueur's Water Dragon	3	—	—	—	1	—	1/1
Physignathus cocincinus	Cochin China Water Dragon	2	1	—	—	1	—	1/1
Chamaeleo dilepis	Flap-necked Chameleon	1	—	—	—	1	—	—
Egernia striolata	Australian Tree Skink	8	—	5	—	1	—	1/1/10
Trachydosaurus rugosus	Shingleback	6	5	—	—	3	—	3/1/4
Tiliqua scincoides scincoides	Eastern Blue-tongued Skink	13	—	—	—	1	2	6/2/2
Tiliqua scincoides intermedia	Northern Blue-tongued Skink	2	—	—	—	—	—	1/1
Tiliqua nigrolutea	Blotched Blue-tongued Skink	—	4	—	—	—	—	0/0/4
Mabuya brevicollis	Short-necked Skink	1	—	—	—	—	—	1/0
Ctenotus taeniolatum	Coppertailed Skink	25	—	9	2	14	—	0/0/18
Gerrhosaurus major	Tawny Plated Lizard	4	—	—	—	—	2	1/1
Lacerta lepida	Eyed Lizard	14	2	41	1	2	41	4/8/1
Lacerta lepida pater	Moroccan Eyed Lizard	8	—	—	—	—	4	1/2/1
Podarcis lilfordi	Lilford's Wall Lizard	—	2	—	—	—	—	1/1
Eremias burchelli	Burchell's Sand Lizard	4	—	—	—	3	—	0/0/1
Trogonophis wiegmanni	Wiegmann's Burrowing Lizard	1	—	—	—	—	—	0/0/1
Varanus exanthematicus albigularis	Bosc's Monitor	1	—	—	—	—	—	1/0
Heloderma suspectum	Gila Monster	—	2	—	—	—	—	0/2
Ophisaurus apodus	Glass Snake	—	3	—	—	—	—	0/0/3
Anguis fragilis	Slow Worm	1	—	—	—	—	—	0/0/1
Cordylus giganteus	Sungazer	1	—	—	—	—	—	0/0/1
Cordylus warreni breyeri	Breyer's Girdled Lizard	3	—	—	—	—	—	1/0/2
Cordylus cordylus jonesii	Jones' Armoured Lizard	1	—	—	—	—	1	—
Pseudocordylus microlepidotus	Small-scaled Girdled Lizard	5	—	—	—	—	—	0/0/5
Platysaurus guttatus minor	Lesser Red-tailed Rock Lizard	1	—	—	—	—	1	—
SERPENTES								
Liasis fuscus	Australian Water Python	2	1	—	—	1	—	0/2
Liasis childreni	Children's Python	7	3	—	—	—	1	4/3/2
Morelia spilotus spilotus	Diamond Python	5	—	—	—	1	3	1/0
Morelia spilotus variegata	Carpet Python	3	9	10	—	1	12	5/3/1
Python reticulatus	Reticulated Python	2	—	—	—	—	—	1/1
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
Python molurus molurus	Indian Python	—	2	—	—	—	—	0/2
Python molurus bivittatus	Malaysian Rock Python	4	—	15	3	1	12	1/2
Python regius	Royal Python	2	2	—	—	1	—	2/1
Calabaria reinhardtii	Calabar Ground Python	2	—	—	—	—	—	1/1
Epicrates cenchria	Rainbow Boa	—	4	—	—	—	2	2/0
Candoia asper	Fierce Papuan Boa	—	4	—	—	2	—	1/1
Liasis boa S (Schlegel)	Blue-ring Boa	—	1	—	—	—	—	0/1
Eunectes notaeus	Yellow Anaconda	3	—	—	—	—	—	1/2
Boa constrictor	Boa Constrictor	7	31	—	—	1	24	3/4/6
Natrix tessellata	Diced Water Snake	—	2	—	—	2	—	—
Thamnophis sirtalis	Common Garter Snake	1	—	—	—	1	—	—
Thamnophis sirtalis parietalis	Red-sided Garter Snake	1	—	—	—	—	—	0/0/1
Boaedon fuliginosus	African House Snake	1	—	—	—	—	1	—
Drymarchon corais couperi	Eastern Indigo Snake	—	2	—	—	—	—	1/1
Elaphe guttata	Corn Snake	—	4	6	—	—	7	2/1
Elaphe obsoleta obsoleta	Black Rat Snake	2	—	—	—	—	—	1/1
Elaphe obsoleta quadrivittata	Yellow Rat Snake	—	1	—	—	—	1	—
Elaphe obsoleta rossalleni	Everglades Rat Snake	4	—	—	—	—	4	—
Elaphe obsoleta spiloides SS (Dumeril, Bibron, Dumeril)	Gray Rat Snake	—	1	—	—	—	—	1/0
Coluber najadum	Dahl's Whip Snake	2	—	—	—	—	1	0/0/1
Coluber rhodorhachis	Cliff Racer	—	1	—	—	1	—	—
Pituophis melanoleucus melanoleucus	Northern Pine Snake	4	1	—	—	—	2	2/1
Pituophis melanoleucus affinis SS (Hallowell)	Sonora Gopher Snake	—	1	—	—	—	1	—
Hydrodynastes gigas	Boipevassu Snake	2	—	7	1	—	6	1/1
Lampropeltis getulus californiae	Californian King Snake	4	2	1	—	—	1	2/2/2
Lampropeltis triangulum sinaloae	Sinaloan Milk Snake	13	—	18	—	—	20	3/5/3
Lampropeltis triangulum hondurensis	Honduras King Snake	4	—	—	—	—	—	2/2
Lampropeltis triangulum annulata	Mexican Milk Snake	4	2	—	—	—	2	3/1
Lampropeltis triangulum polyzona SS (Cope)	Central American Milk Snake	—	2	—	—	—	2	—
Lampropeltis pyromelana pyromelana	Arizona Mountain King Snake	3	—	—	—	—	—	2/1
Lampropeltis mexicana alterna	Grey-banded King Snake	2	2	—	—	—	—	1/3
Malpolon monspessulanus	Montpellier Snake	1	—	—	—	—	—	0/0/1
Malpolon moilensis	Moila Snake	—	1	—	—	—	—	0/0/1
Dispholidus typus	Boomslang	2	—	—	—	—	—	1/1
Pseudechis guttatus	Spotted Black Snake	1	—	—	—	—	1	—
Oxyuranus scutellatus G (Peters)	Taipan	—	2	—	—	—	—	0/2
Notechis scutatus	Tiger Snake	2	—	—	—	1	—	0/1
Bungarus multicinctus	Many-banded Krait	1	—	—	—	1	—	—
Walterinnesia aegyptia	Innes' Cobra	2	—	9	—	1	4	2/4
Naja melanoleuca	Black and White Cobra	2	—	—	—	—	—	2/0
Naja naja	Indian Cobra	2	—	5	—	1	2	1/1/2
Dendroaspis viridis	Hallowell's Green Mamba	—	2	—	—	—	—	1/1
Dendroaspis angusticeps	Common Green Mamba	1	—	—	—	—	—	0/1
Dendroaspsis polylepis	Black Mamba	2	—	—	—	—	—	1/1
Vipera xanthina palaestinae	Palestine Viper	3	—	—	—	—	—	2/1
Vipera ammodytes meridionalis	Long-nosed Viper	3	—	—	—	—	—	2/1
Bitis arietans	Puff Adder	1	—	—	—	—	—	0/1
Bitis gabonica	Gaboon Viper	3	—	—	—	1	—	0/2
Cerastes cerastes	Horned Cerastes Viper	—	1	—	—	—	1	—
Cerastes vipera	Lesser Cerastes Viper	1	—	—	—	1	—	—
Echis coloratus	Burton's Carpet Viper	—	1	—	—	—	1	—
Eristocophis mcmahoni	McMahon's Sand Viper	—	1	—	—	1	—	—
Agkistrodon bilineatus	Mexican Cantil	2	—	—	—	—	—	0/0/2
Agkistrodon contortrix mokeson	Northern Copperhead	2	—	—	—	—	—	1/1
Sistrurus miliarius	Pygmy Rattlesnake	1	—	—	—	1	—	—
Sistrurus catenatus tergeminus	Western Massasauga	3	—	—	—	—	—	1/2
Crotalus atrox	Western Diamond-backed Rattlesnake	1	—	—	—	—	—	1/0
Crotalus mitchelli	Speckled Rattlesnake	—	1	—	—	—	1	—
	Total-Reptiles	386	139	253	14	79	284	401

Amphibians

CAUDATA

Necturus maculosus	Mudpuppy	1	—	—	—	—	—	0/0/1
Andrias japonicus	Japanese Giant Salamander	1	—	—	—	—	—	0/0/1
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
Triturus cristatus	Crested Newt	6	—	—	—	—	—	0/0/6
Triturus marmoratus	Marbled Newt	—	1	—	—	—	—	0/0/1
Triturus vulgaris	Common Smooth Newt	14	—	—	—	2	—	0/0/12
Cynops pyrrhogaster	Japanese Newt	—	2	—	—	—	—	0/0/2
Taricha granulosa	Rough-skinned Newt	4	—	—	—	—	—	0/0/4
Salamandra salamandra	Fire Salamander	7	1	—	—	—	2	0/0/6
Ambystoma tigrinum	Tiger Salamander	1	—	—	—	—	—	0/0/1
Ambystoma mexicanum	Axolotl	27	7	50	—	3	—	0/0/81
Ambystoma maculatus	American Spotted Salamander	1	—	—	—	—	—	0/0/1
ANURA								
Xenopus laevis	Clawed Frog	12	3	—	—	1	—	0/0/14
Pipa pipa	Surinam Toad	2	—	—	—	1	—	0/0/1
Bombina orientalis	Oriental Toad	6	3	—	—	—	—	0/0/9
Bombina variegatus	Yellow-bellied Toad	6	—	—	—	—	—	0/0/6
Bufo viridis	Green Toad	3	—	—	—	—	—	0/0/3
Bufo bufo	Common Toad	4	1	—	—	1	—	0/0/4
Bufo blombergi	Blomberg's Toad	—	15	—	—	15	—	—
Bufo marinus	Cane Toad	3	—	—	—	1	—	0/0/2
Hyla cinerea	Green Tree Frog	2	3	—	—	—	2	0/0/3
Hyla gratiosa	Barking Tree Frog	3	—	—	—	2	—	0/0/1
Hyla rubra	Daudin's Hyla	1	1	—	—	—	1	0/0/1
Gastrotheca marsupiata	Marsupial Frog	3	—	—	—	2	—	0/0/1
Ceratophrys cornuta	Horned Toad	—	2	—	—	—	—	0/0/2
Rana ridibunda	Marsh Frog	5	—	—	—	1	—	0/0/4
Rana temporaria	Common Frog	1	1	—	—	—	—	0/0/2
Rana catesbeiana	American Bullfrog	5	—	—	—	3	—	0/0/2
Kassina senegalensis	Senegalese Striped Frog	2	—	—	—	—	—	0/0/2
Atelopus ignescens	Fiery Frog	—	3	—	—	3	—	—
	Total-Amphibians	120	43	50	—	35	5	173

WHIPSNADE PARK

Mammals

MARSUPIALIA

Macropus rufogriseus	Red-necked Wallaby	480	—	209	—	50	98	32/50/459

PRIMATES

Saimiri sciureus	Squirrel Monkey (Black-capped form)	25	—	7	1	1	10	4/7/9
Callithrix jacchus	Common Marmoset	1	—	—	—	1	—	—
Pan troglodytes	Chimpanzee	8	—	1	—	—	—	4/5

RODENTIA

Cynomys ludovicianus	Prairie Marmot	84	—	—	—	—	—	0/0/84
Dolichotis patagonum	Mara	12	—	4	1	6	1	2/2/4

CETACEA

Tursiops truncatus	Bottle-nosed Dolphin	3	—	1	1	2	—	1/0

CARNIVORA

Canis lupus	Grey Wolf	16	—	11	4	3	5	5/5/5
Lycaon pictus	Cape Hunting Dog	3	—	—	—	—	—	1/2
Tremarctos ornatus	Spectacled Bear	1	—	—	—	—	1	—
Ursus arctos	Brown Bear	3	—	—	—	—	—	1/2
Ursus arctos	Brown Bear (Kodiak form)	2	—	—	—	—	—	1/1
Thalarctos maritimus	Polar Bear	2	—	—	—	—	2	—
Ailurus fulgens	Red Panda	2	1	—	—	1	—	1/1
Nasua nasua	Ring-tailed Coati	9	—	5	—	3	2	1/8
Felis lynx	Northern Lynx	7	—	2	—	—	7	1/1

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

		1	2	3	4	5	6	7
Felis serval	Serval	2	—	—	—	—	—	1/1
Panthera leo	Lion	4	—	4	4	1	—	1/2
Panthera tigris	Tiger (Siberian form)	4	—	4	2	—	4	1/1
Panthera onca	Jaguar	4	—	3	—	—	5	1/1
Acinonyx jubatus	Cheetah	20	3	10	2	—	16	2/8/5
PINNIPEDIA								
Zalophus californianus	Californian Sealion	2	—	—	—	—	—	2/0
Phoca vitulina	Common Seal	1	—	—	—	—	—	1/0
Halichoerus grypus	Grey Seal	1	—	—	—	—	—	0/1
PROBOSCIDEA								
Elephas maximus	Indian Elephant	1	—	—	—	—	—	0/1
Loxodonta africana	African Elephant	2	—	—	—	—	—	1/1
PERISSODACTYLA								
*Equus burchelli**	Common Zebra	1	—	—	—	1	—	—
*Equus grevyi**	Grevy's Zebra	7	2	—	—	3	—	1/5
*Equus hemionus**	Onager (Persian form)	6	—	—	—	1	1	1/3
*Equus przewalskii**	Przewalski's Horse	10	3(2)	5	—	1	3(1)	3/11
Rhinoceros unicornis	Indian Rhinoceros	3	—	—	—	—	—	2/1
Diceros bicornis	Black Rhinoceros	3	—	—	—	1	1	0/1
Ceratotherium simum	White Rhinoceros	15	—	2	—	1	1	4/11
ARTIODACTYLA								
Sus scrofa	Wild Boar	2	—	—	—	—	2	—
*Phacochoerus aethiopicus**	Wart Hog	1	—	—	—	—	—	1/0
*Tayassu tajacu**	Collared Peccary	10	—	2	—	1	1	2/4/4
Hippopotamus amphibius	Hippopotamus	3	—	—	—	—	—	2/1
Choeropsis liberiensis	Pygmy Hippopotamus	7	—	—	—	1	—	1/5
*Lama glama**	Llama	15	—	9	3	1	16	4/0
*Lama guanicoe**	Guanaco	19	—	11	1	1	18	2/8
Camelus bactrianus	Bactrian Camel	18	—	2	—	1	2	2/15
Camelus dromedarius	Arabian Camel	8	—	—	—	—	1	2/5
Muntiacus reevesi	Reeves's Muntjac	24	—	7	—	8	1	6/10/6
Dama dama	Fallow Deer	60	—	27	4	3	36	8/20/16
*Axis axis**	Axis Deer	31	—	15	11	2	—	16/14/3
*Axis porcinus**	Hog Deer	33	—	13	6	7	—	13/10/10
*Cervus duvauceli**	Barasingha	20	—	4	2	4	—	9/9
*Cervus nippon**	Sika Deer (Ryukyu × Japanese form)	20	—	9	2	1	26	—
Cervus nippon	Sika Deer (Formosan form)	33	—	16	11	1	7	9/21
*Elaphurus davidianus**	Père David's Deer	67	—	22	1	3	32	13/32/8
Alces alces	Moose	3	—	—	—	2	—	1/0
Rangifer tarandus	Reindeer	12	—	4	1	3	—	5/7
Hydropotes inermis	Chinese Water Deer	142	—	65	5	12	81	0/0/109
Giraffa camelopardalis	Giraffe	3	—	—	—	—	—	1/2
*Tragelaphus spekei**	Sitatunga	11	1	5	1	1	5	4/6
*Boselaphus tragocamelus**	Nilgai	29	—	18	3	2	24	2/16
Bos grunniens	Yak	14	—	3	—	1	3	4/9
*Syncerus caffer**	African Buffalo	6	2	—	—	1	2	2/3
Bison bonasus	European Bison	14	—	5	1	—	9	1/8
Bison bison	American Bison	8	—	1	—	1	3	2/3
*Kobus ellipsiprymnus**	Common Waterbuck	7	—	2	—	3	—	2/4
*Oryx gazella**	Gemsbok	3	1	—	—	1	—	2/1
*Oryx tao**	Scimitar-horned Oryx	10	—	7	1	—	—	3/13
*Damaliscus dorcas**	Blesbok	5	1	1	—	3	—	0/4
*Antilope cervicapra**	Blackbuck	8	2(2)	—	—	4	1	5/0
*Gazella thomsoni**	Thomson's Gazelle	14	5	—	—	2	1	2/11/3
Ovibos moschatus	Musk Ox	5	—	1	—	1	—	1/4
Ovis musimon	Mouflon	33	—	30	7	2	31	4/19
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
DOMESTIC								
	Ponies	20	—	3	—	—	4	10/9
	Pygmy Donkey	2	—	—	—	—	—	1/1
	Windsor White Goat	20	—	7	1	1	8	5/12
	Dorset Down Sheep	—	2(2)	—	—	—	2	—
	Total-Mammals	1484	23(6)	557	76	150	473(1)	1365
Birds								
STRUTHIONIFORMES								
Struthio camelus	Ostrich	2	—	—	—	—	—	1/1
RHEIFORMES								
Rhea americana	Common Rhea	7	—	1	1	—	1	2/1/3
CASUARIIFORMES								
Casuarius casuarius	Australian Cassowary	2	—	—	—	—	—	1/1
Dromaius novaehollandiae	Emu	6	—	—	—	—	—	2/2/2
SPHENISCIFORMES								
Aptenodytes patagonica	King Penguin	11	—	1	—	—	—	4/4/4
Eudyptes crestatus	Rockhopper Penguin	8	—	—	—	—	—	5/3
Spheniscus humboldti	Humboldt's Penguin	36	—	24	4	—	18	13/13/12
CICONIIFORMES								
Ciconia ciconia	White Stork	7	—	—	—	—	—	3/4
Phoenicopterus ruber roseus	Greater Flamingo	25	—	—	—	—	—	8/17
Phoenicopterus ruber ruber	Rosy Flamingo	60	—	5	—	3	—	20/20/22
Phoenicopterus chilensis	Chilean Flamingo	44	—	—	—	1	—	14/14/15
ANSERIFORMES								
Dendrocygna bicolor	Fulvous Whistling Duck	1	—	—	—	—	—	1/0
Cygnus atratus	Black Swan	11	—	—	—	1	—	1/9
Cygnus melanocoryphus	Black-necked Swan	2	1	—	—	—	1	1/1
Cygnus cygnus	Whooper Swan	2	—	2	—	—	—	1/1/2
Anser anser	Greylag Goose	7	—	—	—	—	—	2/2/3
Anser indicus	Bar-headed Goose	39	—	3	1	1	—	8/8/24
Anser caerulescens caerulescens	Lesser Snow Goose	9	—	4	1	—	—	2/3/7
Anser caerulescens atlanticus	Greater Snow Goose	18	—	—	—	1	6	2/2/7
Anser canagicus	Emperor Goose	12	—	2	—	—	—	4/3/7
Branta sandvicensis	Hawaiian Goose	4	—	—	—	—	—	2/2
Branta canadensis	Canada Goose	16	—	15	—	3	8	4/4/12
Branta leucopsis	Barnacle Goose	19	—	—	—	—	—	3/3/13
Branta ruficollis	Red-breasted Goose	34	—	4	—	2	4	19/10/3
Cereopsis novaehollandiae	Cape Barren Goose	16	—	—	—	2	3	4/2/5
Alopochen aegyptiacus	Egyptian Goose	9	—	—	—	—	—	2/2/5
Tadorna cana	South African Shelduck	21	—	—	—	1	—	6/7/7
Tadorna variegata	New Zealand Shelduck	4	—	5	—	—	—	5/2/2
Tadorna tadorna	Shelduck	15	—	—	—	1	3	6/3/2
Plectropterus gambensis	Spur-winged Goose	2	—	—	—	—	—	1/1
Aix sponsa	Carolina Duck	10	—	10	1	1	9	5/4
Aix galericulata	Mandarin Duck	10	—	—	—	1	—	2/7
Chenonetta jubata	Maned Goose	6	—	—	—	—	—	4/2
Anas penelope	Wigeon	6	—	—	—	—	—	2/3/1
Anas sibilatrix	Chiloe Wigeon	16	—	2	—	1	2	4/5/6
Anas falcata	Falcated Teal	5	—	—	—	—	—	2/3
Anas strepera	Gadwall	1	3	—	—	2	—	2/0
Anas formosa	Baikal Teal	4	—	—	—	—	1	3/0
Anas crecca	Teal	1	4	—	—	3	—	2/0
Anas specularioides	Crested Duck	12	—	—	—	1	—	2/3/6
Anas acuta	Pintail	3	—	—	—	—	—	1/2
Anas bahamensis	Bahama Pintail	4	—	2	—	—	3	2/1
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
Anas querquedula	Garganey	2	8(6)	—	—	1	3	1/5
Anas clypeata	Shoveler	5	—	—	—	1	—	0/4
Netta rufina	Red-crested Pochard	2	4	—	—	—	—	4/2
Aythya ferina	European Pochard	4	—	—	—	—	—	2/2
Aythya fuligula	Tufted Duck	8	—	—	—	1	—	2/5
Aythya marila	Greater Scaup	2	2	—	—	—	—	2/2
Somateria mollissima	Eider Duck	18	—	2	—	1	—	6/11/2
Bucephala islandica	Barrow's Goldeneye	4	—	—	—	—	—	2/2
Oxyura jamaicensis jamaicensis	North American Ruddy Duck	—	15	—	—	—	1	14/0
Oxyura vittata	Argentine Ruddy Duck	—	5	—	—	1	—	4/0
FALCONIFORMES								
Gyps rueppellii	Ruppell's Griffon Vulture	2	—	—	—	—	—	1/0/1
Gyps fulvus	Griffon Vulture	2	—	—	—	—	—	2/0
Torgos tracheliotus	Lappet-faced Vulture	2	—	—	—	—	—	1/1
Sagittarius serpentarius	Secretary Bird	2	—	—	—	—	2	—
GALLIFORMES								
Meleagris gallopavo	North American Turkey	25	—	—	—	5	3	0/0/17
Lophortxy californica	Californian Quail	—	2	—	—	—	—	1/1
Lophophorus impeyanus	Impeyan Pheasant	7	—	—	—	—	3	1/3
Gallus sonneratii	Sonnerat's Jungle Fowl	10	7(7)	—	—	4	4(1)	3/5/1
Lophura nycthemera	Silver Pheasant	1	2	—	—	—	—	1/2
Lophura imperialis	Imperial Pheasant	2	—	—	—	—	—	1/1
Lophura swinhoii	Swinhoe's Pheasant	5	—	—	—	1	—	2/2
Crossoptilon mantchuricum	Brown Eared Pheasant	9	—	9	—	2	7	2/3/4
Crossoptilon auritum	Blue Eared Pheasant	2	—	—	—	—	—	1/1
Catreus wallichi	Cheer Pheasant	4	1	—	—	—	—	2/3
Syrmaticus mikado	Mikado Pheasant	3	—	—	—	1	—	0/2
Chrysolophus pictus	Golden Pheasant	9	—	—	—	—	1	3/5
Chrysolophus amherstiae	Lady Amherst's Pheasant	2	2	—	—	1	—	1/2
Pavo cristatus	Common Peafowl	153	7	—	—	6	87	0/0/67
Numida meleagris	Helmeted Guineafowl	18	—	—	—	2	2	0/0/14
GRUIFORMES								
Grus grus	Common Crane	1	—	—	—	—	—	1/0
Grus monacha	Hooded Crane	2	—	—	—	1	—	0/1
Grus canadensis	Sandhill Crane	3	—	—	—	—	—	1/2
Grus japonensis	Red Crowned Crane	7	2	2	—	—	4	3/2/2
Grus vipio	White-naped Crane	7	—	2	—	—	1	3/3/2
Grus rubicunda	Brolga	2	—	—	—	—	—	0/2
Bugeranus carunculatus	Wattled Crane	6	—	3	1	2	4	1/1
Anthropoides virgo	Demoiselle Crane	6	—	—	—	2	—	1/0/3
Anthropoides paradisea	Stanley Crane	3	—	—	—	—	—	2/1
Balearica pavonina	West African Crowned Crane	3	—	—	—	1	—	0/2
Balearica regulorum	South African Crowned Crane	14	—	—	—	—	—	7/4/3
Choriotis kori	Kori Bustard	5	—	—	—	—	1	1/3
PSITTACIFORMES								
Pseudoes fuscata	Dusky Lory	2	—	—	—	—	—	1/1
Trichoglossus haematodus	Swainson's Lorikeet	3	—	—	—	—	—	0/0/3
Calyptorhynchus funereus baudinii	White-tailed Black Cockatoo	2	—	—	—	—	—	1/1
Eolophus roseicapillus	Roseate Cockatoo	15	—	—	—	—	—	7/8
Cacatua leadbeateri	Leadbeater's Cockatoo	1	—	—	—	—	—	1/0
Cacatua sulphurea	Lesser Sulphur-crested Cockatoo	1	—	—	—	—	—	0/1
Cacatua galerita galerita	Greater Sulphur-crested Cockatoo	1	1(1)	—	—	—	—	1/1
Cacatua sanguinea anguinea	Bare-eyed Cockatoo	3	—	—	—	—	—	2/1
Nymphicus hollandicus	Cockatiel	6	—	2	—	—	1	1/1/5
Alisterus scapularis	King Parrot	2	—	1	—	—	—	1/1/1
Platycercus eximius cecilae	Golden-mantled Rosella	2	—	—	—	—	—	0/0/2
Psephotus haematonotus	Red-rumped Parrakeet	14	—	2	—	2	4(1)	2/1/7
Psittacus erithacus	Grey Parrot	3	2	—	—	1	—	1/1/2
Psittacula eupatria nipalensis	Alexandrine Parrakeet	1	1(1)	—	—	—	—	1/1
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
Psittacula krameri manillensis	Indian Ring-necked Parrakeet	7	—	—	—	—	1	2/1/3
Ara macao	Scarlet Macaw	4	—	—	—	—	—	2/2
Ara chloroptera	Green-winged Macaw	4	—	—	—	—	—	2/2
Amazona aestiva	Blue-fronted Amazon Parrot	1	—	—	—	—	—	1/0
Amazona ochrocephala	Yellow-fronted Amazon Parrot	1	—	—	—	—	—	0/1
Amazona amazonica	Orange-winged Amazon Parrot	3	—	—	—	—	—	1/0/2
STRIGIFORMES								
Tyto alba	Barn Owl	2	—	—	—	1	—	0/1
Nyctea scandiaca	Snowy Owl	2	2(1)	—	—	1	1	1/1
Strix aluco sylvatica	Tawny Owl	2	—	—	—	—	—	1/1
CORACIIFORMES								
Dacelo novaeguineae	Kookaburra	2	—	—	—	—	—	1/1
PASSERIFORMES								
Estrilda melpoda	Orange-cheeked Waxbill	4	—	—	—	—	—	2/2
Estrilda troglodytes	Red-eared Waxbill	1	—	—	—	1	—	—
Amandava subflava	Golden-breasted Waxbill	2	—	—	—	—	—	1/1
Gracula religiosa	Hill Mynah	1	—	—	—	—	—	0/0/1
Urocissa erythrorhyncha occipitalis	Red-billed Blue Pie	2	—	—	—	—	—	0/0/2
Total-Birds		983	71(16)	103	9	64	189(2)	895

Summary
Regent's Park

	1	2	3	4	5	6	7	Number of Species (excluding domestic)
Mammals	1364	193(1)	843	107	403	619(6)	1271	139
Birds	1158	108(2)	199	9	151	166(16)	1139	258
Reptiles	386	139	253	14	79	284	401	99
Amphibians	120	43	50	—	35	5	173	27
Total	3028	483(3)	1345	130	668	1074(22)	2984	523

Estimated number of fishes and invertebrates in the Collection at 31 December 1984:

Fishes				Approx 1950		195 species		
Invertebrates (excluding some insect species)				1850		108 species		
Whipsnade Park								
Mammals	1484	23(6)	557	76	150	473(1)	1365	61
Birds	983	71(16)	103	9	64	189(2)	895	108
Total	2467	94(22)	660	85	214	662(3)	2260	169
Grand Total— Zoological Society of London	5495	577	2005	215	882	1736	5244	692*

*The species common to Regent's Park and Whipsnade are counted as one.

Advisory and Consultant Services

Animal Management and Conservation

Al-Areen Wildlife Park, Bahrain: Advice on and assistance with animal management.

American Association of Zoological Parks and Aquariums: Collaboration on co-operative breeding programmes.

Doha Zoo, Municipality of Doha, Qatar: Management of the national zoo for the Qatar Government.

Mahidol University, Bangkok: Advice on housing and husbandry of venomous snakes.

Ministry of Forestry, People's Republic of China (with International Union for Conservation of Nature and Natural Resources/World Wildlife Fund/Woburn Estate/North of England Zoological Society/Oxford University): Collaborative project on reintroduction of Père David's Deer to the wild.

Mirpur Zoo, Dhaka, People's Republic of Bangladesh (with Overseas Development Administration): General advice on zoo management with assistance and training in animal husbandry and handling.

Police Forces: Advice on wild animal capture techniques.

Sharjah, U.A.R.: Advice to HH The Ruler on a programme to manage the new Sharjah Zoological Gardens.

Wolong Natural Reserve Panda Research Station, People's Republic of China (with World Wildlife Fund): Advice on and assistance with the development of a management programme for the Giant Panda.

Architecture and Planning

Bahrain: For the Al-Areen Wildlife Park and Reserve. Preparing proposals for the development of the existing Visitors Centre, including a walk-through aviary, and obtaining tenders.

Sharjah: Advising the Halcrow Group Architectural Practice for the proposed new Zoological Gardens, and other projects.

Qatar: Advice to the John S. Bonnington Partnership on the development at the new Doha Zoo.

Comparative Medicine and Physiology

Animal Health Trust Equine Research Station, Newmarket: Collaborative examination of equine grass-sickness samples for botulism.

British Museum (Natural History) (Department of Paleontology): X-ray of the Singah skull.

Central Middlesex Hospital (Action for Research into Multiple Sclerosis unit): Collaborative studies on nutrition management in multiple sclerosis.

Department of the Environment: Laboratory examinations for diagnosis of botulism, mainly in water birds.

Greater London Council: Laboratory examinations for diagnosis of botulism, mainly in water birds.

Hammersmith Hospital (Department of Obstetrics & Gynaecology): Collaborative research on human sperm motility.

Hospital for Tropical Diseases, London: Laboratory service for testing of serum for diagnosis of *Toxocariasis*.

Institute of Primate Research, National Museums of Kenya: Joint studies on reproductive endocrinology and behaviour in primates.

Institute of Obstetrics and Gynaecology, Hammersmith Hospital: Collaborative research on follicular development in the Marmoset.

Kenya Agricultural Research Institute (Muguga) and Veterinary Research Laboratory (Kabete): Collaborative projects on contagious bovine and caprine pleuropneumonia.

King's College Hospital Medical School: Collaborative research on human sperm motility.

Dr Jonathan Kingdon: X-rays of hands and feet of *Cercopithecioidea*.

Medical Research Council Reproductive Biology Unit, Edinburgh: Joint study on corpus luteum function in the Marmoset.

Middlesex Hospital (Department of Reproductive Medicine): Collaboration on the endocrinology of anovulation.

Ministry of Agriculture, Fisheries and Food: (Shinfield, Reading) Collaboration on enzyme assays for steroid hormones. (Veterinary Investigation Service) Laboratory examinations for diagnosis of botulism, mainly in water birds.

Open University: X-ray of Leopard Gecko.

Royal Veterinary College: Collaborative studies on semen preservation. Laboratory examinations for diagnosis of botulism, mainly in water birds.

St George's Hospital Medical School: Collaborative studies on development of thermoregulation and metabolism in marsupials.

Surrey University (Department of Biochemistry): Collaborative research on the role of the pineal gland in regulating seasonal breeding in mammals.

TBA Equine Fertility Unit, Cambridge: Collaborative studies on embryo transfer in wild Equidae.

University of Sydney: Collaborative studies on primate early pregnancy proteins.

Veterinary Practices: Laboratory examinations for diagnosis of botulism, mainly in water birds.

Windsor Safari Park: Ultrasonography of Bottle-nosed Dolphin.

World Health Organisation: The Institute of Zoology is a collaborating centre for malaria reference and research, comparative medicine and pathology of non-domestic vertebrates, reproduction and child health milk. Staff visited Cuba and Singapore to give lectures and practical courses in serology; and visited Kenya, Switzerland, Thailand and the USA to give lectures and technical advice on primate reproductive physiology and the study of infertility agents from plants.

World Wildlife Fund/Ministry of Forestry, People's Republic of China: Advice on reproductive physiology of the Giant Panda.

Zoos: Radioimmunoassay for monitoring hormonal status and pregnancy in primates. Laparoscopic examination of monomorphic birds and reptiles for sex determination.

Training and International Liaison

British Council: Training of visiting workers in hormone assays and serology.

Ministry of Forestry, People's Republic of China: Training of visiting workers in reproductive physiology and veterinary medicine.

University of Beijing, People's Republic of China: Training of visiting workers in reproductive physiology and hormone assays.

Universities: Training of students from the UK and overseas in microbiology, radioimmunoassay, gamete biology, behavioural studies and veterinary medicine.

VETERINARY CONSULTANCY SERVICES

Berlin Zoo: Advice on and assistance with the treatment and intensive care of the Giant Panda 'Tjen Tjen'.

World Wildlife Fund/Ministry of Forestry, People's Republic of China: Advice on and assistance with the veterinary care of the Giant Panda.

Consultant Veterinary Advice: Government departments; Research institutes; Zoological collections, and Veterinary practices both in the UK and abroad.

Representation on Scientific Societies, Zoological, Conservation and Research Organizations

The Society's staff, whether in an individual capacity or as representatives of the Council, play an active role in many organizations concerned with the publication of specialist journals, animal management, conservation and other specialist research activities.

Anglo-Italian Society for the Protection of Animals: Mr J. A. Knight (Committee)

Anthropoid Ape Advisory Panel: Dr B. C. R. Bertram (Convenor, Scientific Committee).

Association for Animal Haematology: Mr M. G. Hart (Committee Member)

Association of British Wild Animal Keepers: Mr V. J. A. Manton (Vice President)

Australian Research Grants Scheme: Professor J. P. Hearn (Member, Assessors' Panel)

Biological Council: Mr P. J. S. Olney (Council Member)

Birds of the Western Palearctic: Mr P. J. S. Olney (Editorial Board)

British Andrology Society: Dr H. D. M. Moore (Committee Member)

British Deer Society: Dr A. S. I. Loudon (Chairman, Scientific Advisory Panel)

British Journal of Experimental Pathology: Dr G. R. Smith (Editorial Advisory Committee)

British Small Animal Veterinary Association: Mr J. A. Knight (Press & Publications Committee)

British Society of Neuroradiologists: Professor G. H. du Boulay (President)

British Veterinary Zoological Society: Mr V. J. A. Manton (Council)

Brooke Hospital for Animals, Cairo: Mr D. M. Jones (Vice Chairman)

Central Middlesex Hospital: Professor M. A. Crawford (Hon. Secretary, Coronary Prevention Group (CPG); Member, Management Committee of ARMS/CPG Research Unit)

CoEnCo/Wildlife Link Committee: Mr D. M. Jones (Observer)

Department of the Environment: Dr B. C. R. Bertram, Mr D. M. Jones, Mr J. A. Knight, Mr V. J. A. Manton (Secretary of State's List of Inspectors under the Zoo Licensing Act 1981)

European Association for Aquatic Mammals: Mr V. J. A. Manton (Past President)

European Association of Radiology: Professor G. H. du Boulay (President)

Fauna and Flora Preservation Society: Mr D. M. Jones (Vice Chairman)

Florida State Museum (Program for Studies in Tropical Conservation): Dr B. C. R. Bertram (Member, Advisory Committee)

German Research Council: Professor J. P. Hearn (Member, Steering Committee of Primate Research Centre, Göttingen)

Harvard Medical School: Professor J. P. Hearn (Member, Scientific Advisory Committee of New England Primate Research Center)

Inner London Education Authority, Horniman Museum Advisory Committee: Mr M. K. Boorer

International Air Transport Association: Mr V. J. A. Manton (Member, Live Animals Board)

International Council for Bird Preservation: Mr P. J. S. Olney (Chairman, British Section; Member, Executive Committee European Continental Section)

International Journal of Parasitology: Dr A. Voller (Editorial Board)

International Ornithological Committee (Committee of 100): Mr P. J. S. Olney (Member)

International Primatological Society: Professor J. P. Hearn (President Elect)

International Union for the Conservation of Nature and Natural Resources (Species Survival Commission): Dr. B. C. R. Bertram, Mr V. J. A. Manton (Members, Cat Specialist Group), Professor J. P. Hearn (Member, Primate Specialist Group), Mr D. M. Jones (Member, Captive Breeding Specialist Group), Dr A. S. I. Loudon (Member, Endangered Deer Specialist Group), Mr P. J. S. Olney (Zoological Society Representative)

International Union of Directors of Zoological Gardens: Mr D. M. Jones (Zoological Society Representative)

Institute of Biology: Mr D. M. Jones (Deer Liaison Group)

Journal of Clinical Pathology: Dr A. Voller (Editorial Board)

Journal of Comparative Pathology: Dr G. R. Smith (Editorial Board)

Journal of General Microbiology: Dr A. Voller (Editorial Board)

Journal of General Virology: Dr A. Voller (Editorial Board)

Journal of Immunoassay: Dr A. Voller (Editorial Board)

Journal of Immunological Methods: Dr A. Voller (Editorial Board)

Journal of Medical Microbiology: Dr. G. R. Smith (Editorial Board)

Journal of Medical Primatology: Professor J. P. Hearn (Editorial Board)

Journal of Reproduction and Fertility: Professor J. P. Hearn (Executive Council)

Journal of Virological Methods: Dr A. Voller (Editorial Board)

Linnean Society of London: Dr Marcia A. Edwards (Editorial Committee)

Marwell Zoological Society: Mr D. M. Jones (Trustee; Member, Management and Scientific Group), Mr V. J. A. Manton (Vice President)

Medical Research Council: Professor J. P. Hearn (Member, Ad Hoc Group on Supply of Non-Human Primates for Biomedical Research; Member, Advisory Group to review policy on research on In-Vitro Fertilisation and Embryo Transfer

in Humans; Member, Simian Virus Committee; Member, Systems Board Grant Committee 'B')

Medicine: Dr A. Voller (Editorial Board)

Ministry of Agriculture, Fisheries and Food: Mr D. M. Jones (Member, Minister's Review Panel on Bovine Tuberculosis in Badgers)

National Federation of Zoological Gardens of Great Britain and Ireland: Mr D. M. Jones (Council), Mr V. J. A. Manton, Mr P. J. S. Olney (Members, Conservation and Animal Management Committee)

National Museums of Kenya: Professor J. P. Hearn (Member, International Scientific Advisory Board for the Institute of Primate Research)

Nature Conservancy Council: Dr B. C. R. Bertram (Member, Advisory Committee for Animals); Mr D. M. Jones (UK Committee for IUCN)

Neuroradiology: Professor G. H. du Boulay (Editor-in-Chief)

Paddington Technical College: Mr M. K. Boorer, Mr J. Ffinch, Mr D. M. Jones, Mr J. A. Knight (Lecturers)

Parliamentary and Scientific Committee: Professor M. A. Crawford (Member)

Pathological Society of Great Britain and Ireland: Dr G. R. Smith (Committee Member; Member, Microbiological Sub-Committee)

Primate Society of Great Britain: Dr D. H. Abbott (Council; Member, Captive Care Working Party), Dr B. C. R. Bertram (Member, Conservation Working Group; Member, Captive Care Working Party), Dr J. K. Hodges (Council)

Royal Society for the Prevention of Cruelty to Animals: Mr V. J. A. Manton (Member, Wild Animals Advisory Committee)

Royal Society for the Protection of Birds: Mr P. J. S. Olney (Member, Research Advisory Committee)

Royal Society of Medicine: Dr G. R. Smith (Council Member, Section of Comparative Medicine)

Society for the Study of Fertility: Dr J. K. Hodges (Council — until July)

Tropenmedizin und Parasitologie: Dr A. Voller (Editorial Board)

University of Cambridge: Dr D. H. Abbott (Course Lecturer, Anatomy Department)

University of London: Dr D. H. Abbott (Course Lecturer, Zoology & Anatomy Department, University College), Professor G. H. du Boulay (Professor of Neuroradiology and Head of the Lysholm Radiological Department, National Hospital for Nervous Diseases; Chairman, Medical Committee of National Hospital for Nervous Diseases), Mr R. A. Fish (Subject Sub-Committee in Biological Sciences), Professor J. P. Hearn (Visiting Professor, Zoology & Anatomy Department, University College; Member, Board of Studies in Zoology), Dr J. K. Hodges (Course Lecturer, Zoology & Anatomy Department, University College), Mr D. M. Jones (Member, Board of Studies in Zoology; Visiting Lecturer, Department of Medicine, Royal Veterinary College), Mr J. A. Knight (Visiting Lecturer, Zoology & Anatomy Department, University College), Dr H. D. M. Moore (Course Lecturer, Zoology & Anatomy Department, University College), Dr A. Voller (Reader in Immunology of Parasitic Diseases, London School of Hygiene and Tropical Medicine; Council Member, London School of Hygiene and Tropical Medicine)

University of Nottingham School of Agriculture: Professor M. A. Crawford (Honorary Professor in Applied Biochemistry and Nutrition)

Vaccine: Dr A. Voller (Editorial Board)

Veterinary Clinical Data Base Group: Mr S. L. Pugsley (Committee Member)

Wild Mammals in Captivity: Dr B. C. R. Bertram (Editorial Board)

World Health Organization: Professor J. P. Hearn (Chairman, Steering Committee of Task Force on Infertility Agents from Plants; Adviser, Reproductive Physiology and Applied Primate Research, WHO Special Programme of Research in Human Reproduction), Dr A. Voller (Member of Expert Advisory Panel on Parasitology; Member of WHO/IUIS Sub-committee on Standardization of Reagents for Enzyme Immunoassays)

World List of Scientific Periodicals: Mr R. A. Fish (Council)

World Pheasant Association: Mr P. J. S. Olney (Council Member)

World Wildlife Fund: Professor J. P. Hearn, Dr A. S. I. Loudon (Consultant Scientists), Mr D. M. Jones (UK Council member), Mr J. A. Knight (Consultant Veterinarian)

Zoo Biology: Professor J. P. Hearn (Editorial Board)

Regulations

The following amended Regulations, effective from 1 January 1985, were made by the Council pursuant to the power granted in Article 8 of the Charter:

ENTRANCE FEES AND SUBSCRIPTIONS

7. £5 out of the annual subscription of £25 shall be remitted in the case of Ordinary Fellows resident within the British Isles but outside a radius of 50 miles from Charing Cross.
8. £5 out of the annual subscription of £30 shall be remitted in the case of a Scientific Fellow who does not wish to receive the *Journal of Zoology*.
9. £5 out of the annual subscription of £20 shall be remitted in the case of Associates resident within the British Isles but outside a radius of 50 miles from Charing Cross.

12. **Overseas List**
    (i) An Ordinary Fellow who is resident outside the British Isles at the time of his election shall be registered on the Overseas List, in which case £15 out of the annual subscription of £25 shall be remitted.
    (ii) An Ordinary Fellow who takes up residence outside the British Isles after election or intends at any time to reside outside the British Isles for a period of more than twelve months shall be transferred to the Overseas List. During his residence abroad, £15 out of the annual subscription of £25 shall be remitted, except in respect of the year in which he leaves the British Isles.
    (iii) A Scientific Fellow who is resident outside the British Isles at the time of his election shall be registered on the Overseas List. If he does not wish to receive the *Journal of Zoology*, £20 out of the annual subscription of £30 shall be remitted.
    (iv) A Scientific Fellow who takes up residence outside the British Isles after election or intends at any time to reside outside the British Isles for a period of more than twelve months shall be transferred to the Overseas List. If he does not wish to receive the *Journal of Zoology* during his residence abroad, £20 out of the annual subscription of £30 shall be remitted, except in respect of the year in which he leaves the British Isles.
    (v) An Associate who is resident outside the British Isles at the time of his election shall be registered on the Overseas List, in which case £10 out of the annual subscription of £20 shall be remitted.
    (vi) An Associate who takes up residence outside the British Isles after election or intends at any time to reside outside the British Isles for a period of more than twelve months shall be transferred to the Overseas List. During his residence abroad £10 out of the annual subscription of £20 shall be remitted, except in respect of the year in which he leaves the British Isles.

13. **Life Fellows**
The following life composition fees shall be payable by any Fellow who wishes to compound his future subscriptions

Age Group	18–29	30–39	40–49	50–59	60 & over
	£600	£550	£485	£400	£205

provided that any Fellow who has reached the age of sixty-five and has at least twenty-five years membership may compound his future subscriptions by making a single payment of £60 subject, if he is a Scientific Fellow, to relinquishing the privilege of receiving the *Journal of Zoology* without charge.

Any Fellow on the Overseas List may compound his future subscriptions by a single payment bearing the same proportion to the full composition fee for his age group as his annual subscription bears to the full annual subscription, provided that the balance of the full composition fee for his age group shall be payable if and when he becomes resident in the British Isles.

Financial Statements

Income and Expenditure Account
For the year ended 31st December 1984

	Note	1984 £'000s	1984 £'000s	1983 £'000s	1983 £'000s
INCOME FROM ACTIVITIES	2		4,363·3		4,203·4
COST OF ACTIVITIES	2		6,307·2		5,953·5
NET DEFICIT ON ACTIVITIES			(1,943·9)		(1,750·1)
Administrative Expenses			(88·3)		(82·8)
			(2,032·2)		(1,832·9)
Other Operating Income	3		709·9		47·7
			(1,322·3)		(1,785·2)
Income from Investments	4	131·8		104·2	
Interest Receivable	5	20·9		16·3	
Interest Payable	6	(176·0)		(219·4)	
			(23·3)		(98·9)
OPERATING DEFICIT FOR THE YEAR	7		(1,345·6)		(1,884·1)
DEPARTMENT OF ENVIRONMENT—GRANTS	9		2,388·0		2,200·0
			1,042·4		315·9
EXCEPTIONAL ITEM					
Profit on Sale of Investments			339·6		28·3
EXCESS OF INCOME OVER EXPENDITURE			1,382·0		344·2
APPROPRIATION					
Transfer to Building and Equipment Fund			600·0		—
			782·0		344·2
ADVERSE BALANCE BROUGHT FORWARD			(1,037·0)		(1,381·2)
ADVERSE BALANCE CARRIED FORWARD			(255·0)		(1,037·0)

Balance Sheet as at 31st December 1984

	Note	1984 £'000s	1983 £'000s
FIXED ASSETS			
Tangible Assets	10	733·2	—
Investments	11	504·9	1,149·2
		1,238·1	1,149·2
CURRENT ASSETS			
Stocks	12	48·5	17·2
Debtors	13	538·6	357·6
Cash at Bank and in Hand		636·0	50·2
		1,223·1	425·0
CREDITORS: Amount Falling Due Within One Year	14	(1,030·7)	(2,107·1)
NET CURRENT ASSETS/(LIABILITIES)		192·4	(1,682·1)
TOTAL ASSETS LESS CURRENT LIABILITIES		1,430·5	(532·9)
CREDITORS: Amounts Falling Due After More Than One Year	15	(20·0)	(40·0)
		1,410·5	(572·9)
FUNDS AND RESERVES			
Funds	16	554·3	464·1
Building and Equipment Fund	17	1,111·2	—
Income and Expenditure Account		(255·0)	(1,037·0)
		1,410·5	(572·9)

Approved by Council 13th March 1985

PEYTON
Treasurer

SIR WILLIAM HENDERSON
President

Statement of source and application of funds for the year ended 31st December 1984

	1984		1983	
	£'000s	£'000s	£'000s	£'000s
SOURCE OF FUNDS				
Grant from The Department of the Environment		2,388·0		2,200·0
Deficit from operations		(1,345·6)		(1,884·1)
		1,042·4		315·9
Items not involving the movement of Funds				
Composition Fund — Transfer	(0·7)			(0·3)
Depreciation	30·0			—
Transfer from Building and Equipment Fund	(19·8)	9·5		—
Total generated by operations		1,051·9		315·6
Sale Proceeds of Investments				
General Fund	983·8		—	
Surplus on sale of Investments				
Scientific Fund	80·8		41·4	
Scientific Fund — income	9·4		10·2	
Fantham Bequest — income	0·4		0·4	
Benevolent Fund — income	0·2		0·2	
Composition fees received	0·2		1·5	
Grants for Purchase of Fixed Assets	531·0		—	
		1,605·8		53·7
		2,657·7		369·3
APPLICATION OF FUNDS				
Net increase in investments		—		(58·0)
Purchase of tangible fixed assets		(763·2)		—
		1,894·5		311·3
MOVEMENT IN WORKING CAPITAL AND LIQUID FUNDS				
Increase in Stocks	31·3		4·1	
Increase in Debtors	181·0		166·3	
(Increase) in Creditors	(288·5)		(77·7)	
		(76·2)		92·7
Decrease in bank overdraft	1,384·9		227·3	
Increase/(Decrease) in bank balances and deposit	585·8		(8·7)	
		1,970·7		218·6
		1,894·5		311·3

Report of the Auditors

We have audited the financial statements on pages 48 to 58 in accordance with approved Auditing Standards.
In our opinion the financial statements which have been prepared under the historical cost convention, give a true and fair view of the state of affairs at 31st December 1984, and of the excess of income over expenditure and the source and application of funds for the year ended on that date.

FRASER KEEN *Chartered Accountants*
4, London Wall Buildings, London EC2M 5NT
13th March 1985

Notes to the Financial Statements

1. Accounting Policies

(a) *Changes in Presentation of Financial Statements*

The Society has adopted where relevant the accounting requirements of the Companies Act 1981. The presentation of the 1984 financial statements and the comparative figures for 1983 have been amended accordingly.

(b) *Changes in Accounting Policy*

The Society has changed its accounting policy for fixed assets and depreciation to that stated in note 1(e). Freehold land and buildings acquired prior to December 1983 are fully depreciated; other buildings, plant, vehicles and fittings and furnishings were written off in the year of purchase. From January 1984 fixed assets purchased during the year at a cost in excess of £5,000 have been capitalised. Except for motor vehicles, existing assets have not been capitalised. If the previous policy of writing off assets in the year of purchase had been continued, £232,000 would have been written off in the year compared with £30,000 depreciation.

(c) *Basis of Financial Statements*

It has been agreed that the Society will receive from the Department of the Environment a revenue grant of £2 million a year commencing in the Government's financial year to 31st March 1985, subject to review in the third year, and additional contributions towards repayment of the Society's overdraft and capital expenditure within the same period. The financial statements have accordingly been prepared on a going concern basis and under the historical cost convention.

(d) *Consolidation*

The financial statements do not consolidate the results and the assets and liabilities of the Society's wholly owned subsidiaries, Zoo Restaurants Limited and Zoo Enterprises Limited.

Concession fees and covenanted profits of these companies are included in catering and retail services income, note 2(f).

(e) *Fixed Assets and Depreciation*

As mentioned in note 1(b) above the following policy applies from January 1984. Fixed assets acquired by purchase or gift during the year are shown at cost or valuation depreciated on a straight line basis at rates appropriate to write off the cost over their expected useful lives. Freehold buildings will be depreciated over a range of 15 to 40 years; leasehold buildings over the unexpired period of the lease; plant and equipment 5 to 10 years and motor vehicles 5 years.

(f) *Building and Equipment Fund*

The fund comprises grants received and appropriations from income and expenditure account, which are released back to revenue over the expected useful life of the relevant asset by equal annual amounts.

(g) *Grants*

Government grants received of a revenue nature are credited to Income and Expenditure Account for the year in which they are received.

(h) *Stocks*

Stocks are stated at the lower of direct cost and net realisable value with the following exceptions: No value is placed on the animals, farm and garden stocks and the library; stocks of scientific publications are included at nominal valuation.

(i) *Special Funds*

Special funds of the Society which have conditions attached to their use are not included in the Balance Sheet. Details of these are set out in note 19.

(j) *Pension Scheme Arrangements*

The pension scheme of the Society is maintained as a separate trust fund. Payments made to the fund and charged in these financial statements are based on actuarial advice. This year the accruals basis of accounting has been adopted and an additional £106,000 charged in the financial statements. The fund is actuarially valued every three years.

2. INCOME AND EXPENDITURE ON ACTIVITIES is attributable as follows:

	Note	Income £'000s	Expenditure £'000s	1984 Surplus/ (Deficit) £'000s	1983 Surplus/ (Deficit) £'000s
Specific Activities					
Zoological Gardens					
London Zoo	2(a)	2,628·7	3,320·5	(691·8)	(711·6)
Whipsnade Park	2(a)	828·5	1,339·1	(510·6)	(527·2)
Education and XYZ Club	2(b)	80·3	108·8	(28·5)	(6·7)
Library	2(c)	—	87·1	(87·1)	(74·1)
Publications	2(d)	157·3	170·7	(13·4)	37·8
Institute of Zoology	2(e)	594·8	1,270·3	(675·5)	(560·1)
		4,289·6	6,296·5	(2,006·9)	(1,841·9)
General Activities					
Members Subscriptions and Fees		99·4	10·7	88·7	83·7
Transfer: Composition Fees		0·7	—	0·7	0·3
Donations					
Members Committee		—	—	—	10·0
Other		5·9	—	5·9	26·5
Less: Investment Income (Institute of Zoology)		(32·3)	—	(32·3)	(28·7)
		4,363·3	6,307·2		
Net Deficit on Activities				(1,943·9)	(1,750·1)

2. (a) Zoological Gardens

	London Zoo		Whipsnade Park	
	1984 £'000s	1983 £'000s	1984 £'000s	1983 £'000s
Income				
Admission of Visitors	2,429·2	2,252·8	647·3	563·4
Admission of Cars	—	—	79·6	77·4
Catering and Retail Services (Note 2(f))	144·6	172·1	18·3	33·6
Miscellaneous Income	54·9	56·0	83·3	47·0
	2,628·7	2,480·9	828·5	721·4
Expenditure				
Staff and Administration Costs	2,087·6	1,859·6	821·5	732·1
Provisions	224·8	238·0	143·6	142·5
Less: Income from Animal Adoption Scheme	(71·1)	(51·0)	(7·4)	(2·0)
Backlog Maintenance	96·6	92·2	12·3	—
Minor Works	61·2	39·6	48·0	55·7
Works Materials	86·8	156·2	21·4	49·3
Gardening and Forestry	6·8	6·0	4·7	5·6
Miscellaneous Direct Expenses	73·3	95·3	53·4	50·7
Rates and Insurance	57·3	63·4	24·9	16·9
Fuel, Light, Water and Transport	478·0	457·6	137·1	128·7
Advertising and Promotion	211·7	235·6	76·9	69·1
Depreciation	27·3	—	2·7	—
Transferred from Building and Equipment Fund	(19·8)	—	—	—
	3,320·5	3,192·5	1,339·1	1,248·6
(Deficit)	(691·8)	(711·6)	(510·6)	(527·2)

(b) Education and XYZ Club

	1984 £'000s	1983 £'000s
Income		
Education Visits and Club Fees	80·3	90·6
Expenditure		
Staff and Administration Costs	98·4	87·5
Direct Materials	6·9	2·8
Equipment and Supplies	0·7	4·2
Sundry	2·8	2·8
	108·8	97·3
(Deficit)	(28·5)	(6·7)

(c) Library

	1984 £'000s	1983 £'000s
Expenditure		
Staff and Administration Costs	54·8	47·9
Direct Materials	32·3	26·2
(Deficit)	(87·1)	(74·1)

2. **(d) Publications**

	Journal Transactions Symposia	International Zoo Yearbook	Zoological Record Nomenclator	1984 Total	1983 Total
	£'000s	£'000s	£'000s	£'000s	£'000s
Income					
Sales	97·9	37·7	21·7	157·3	168·0
Expenditure					
Staff and Administration Costs	67·1	35·0	18·2	120·3	79·7
Paper & Printing	49·3	(1·7)	—	47·6	47·3
Sundry	(0·5)	0·3	3·0	2·8	3·2
	115·9	33·6	21·2	170·7	130·2
Surplus/(Deficit)	(18·0)	4·1	0·5	(13·4)	37·8

(e) Institute of Zoology

	Veterinary Science	Wellcome Laboratories	Nuffield Laboratories	1984 Total	1983 Total
	£'000s	£'000s	£'000s	£'000s	£'000s
Income					
Fees	6·9	—	—	6·9	5·4
Scientific Fund — investment income (Note 16)	—	32·3	—	32·3	28·7
Grants					
Specific Projects	23·7	238·2	218·7	480·6	484·3
Wolfson Fund	—	—	75·0	75·0	75·0
ABRC Contribution	—	—	—	—	42·5
Donations	—	—	—	—	2·0
	30·6	270·5	293·7	594·8	637·9
Expenditure					
Staff and Administration Costs	254·3	291·0	403·7	949·0	878·6
Direct Materials	30·8	69·1	72·3	172·2	170·4
Equipment and Supplies	1·7	11·0	94·0	106·7	125·4
Sundry	13·9	10·1	18·4	42·4	23·6
	300·7	381·2	588·4	1,270·3	1,198·0
(Deficit)	(270·1)	(110·7)	(294·7)	(675·5)	(560·1)

2. (f) **Catering and Retail Services**

Included under this heading are concession fees and covenanted profits from Zoo Restaurants Ltd and its subsidiary company Zoo Enterprises Ltd as follows:

	1984			1983		
	London Zoo	Whipsnade Park	Total	London Zoo	Whipsnade Park	Total
	£'000s	£'000s	£'000s	£'000s	£'000s	£'000s
Zoo Restaurants Ltd	50·7	9·7	60·4	52·2	8·2	60·4
Zoo Enterprises Ltd	169·2	38·1	207·3	119·9	35·5	155·4
	219·9	47·8	267·7	172·1	43·7	215·8
Less						
Loss on Whipsnade Catering	—	(29·5)	(29·5)	—	(10·1)	(10·1)
Provision for loss on Zoo Restaurants Ltd.	(75·3)	—	(75·3)	—	—	—
	144·6	18·3	162·9	172·1	33·6	205·7

	1984 £'000s	1983 £'000s
3. Other Operating Income		
Income from Consultancies	709·9	47·7

No provision has been made for Taxation on consultancy income received from abroad; the Society does not believe there to be a liability to overseas taxation.

4. Income from Investments		
Listed Investments	131·8	104·2
5. Interest Receivable		
Other	4·4	3·3
Zoo Restaurants Ltd & Zoo Enterprises Ltd	16·5	13·0
	20·9	16·3
6. Interest Payable		
Bank Loans and Overdraft	176·0	219·4
7. Operating Deficit is after charging:		
Auditors Remuneration	10·0	10·2
Depreciation	30·0	—
and after crediting:		
Transfer from Building and Equipment Fund	19·8	—
Income from Consultancies	709·9	47·7

8. STAFF COSTS

	1984 £'000s	1983 £'000s
(a) Wages and Salaries	3,356·1	3,058·8
Employers National Insurance Contributions	319·9	295·7
Other Pension Costs	280·9	266·4
	3,956·9	3,620·9
(b) The average weekly number of employees during the year was made up as follows:		
Zoological Gardens — London Zoo	192	196
— Whipsnade Park	137	136
Education and XYZ Club	7	7
Library	4	4
Publications	10	10
Institute of Zoology	67	68
Administration	34	29
	451	450

9. DEPARTMENT OF THE ENVIRONMENT

	1984 £'000s	1983 £'000s
Grants were received as follows:		
During three months to 31st March	888·0	1,200·0
During nine months to 31st December	1,500·0	1,000·0
	2,388·0	2,200·0

10. TANGIBLE FIXED ASSETS

	Freehold Land and Buildings £'000s	Short Leasehold Buildings £'000s	Plant and Equipment £'000s	Motor Vehicles £'000s	Total £'000s
Cost at 1st January 1984	113·2	—	—	87·8	201·0
Additions during the year	—	531·1*	205·8	26·3	763·2
Cost or Valuation at 31st December 1984	113·2	531·1	205·8	114·1	964·2
DEPRECIATION					
At 1st January 1984	113·2	—	—	87·8	201·0
Charge for the year	—	14·8	11·8	3·4	30·0
Depreciation at 31st December 1984	113·2	14·8	11·8	91·2	231·0
Net Book Value at 31st December 1984	—	516·3	194·0	22·9	733·2

*Includes £103,000 at Valuation by the Society's architect of a structure donated during the year.

11. INVESTMENTS

	1984 £'000s	1983 £'000s
Investments at Cost:		
Quoted Investments	492·8	1,099·1
Uninvested Cash Balances	12·1	50·1
Cost 31st December	504·9	1,149·2
Market Valuation at 31st December	837·0	1,689·3
These Investments are attributed to:		
Main Fund	—	986·0
Scientific Fund	821·8	695·0
Fantham Bequest	15·2	8·3
	837·0	1,689·3

12. STOCKS

	1984 £'000s	1983 £'000s
Raw Materials and Consumables	43·6	12·1
Finished Goods and Goods for Resale	4·9	5·1
	48·5	17·2

Stocks of animal provisions and works materials of £32,000 have been introduced this year.

13. DEBTORS

Amounts due from Zoo Restaurants Ltd. and Zoo Enterprises Ltd.	9·3	48·7
Other Debtors	510·6	290·4
Prepayments and Accrued Income	18·7	18·5
	538·6	357·6

14. CREDITORS: Amounts Falling Due Within One Year

Bank Overdraft	—	1,384·9
Amounts due to Zoo Enterprises Ltd.	—	15·0
VAT, PAYE and National Insurance Contributions	99·0	144·4
Other Creditors	668·5	501·4
Accruals	263·2	61·4
	1,030·7	2,107·1

15. CREDITORS: Amounts Falling Due After More Than One Year

Deposited Covenant	20·0	40·0

16. FUNDS

	Heer Bequest	Fantham Bequest	Scientific Fund	Composition Fund	Staff Benevolent Fund	Total
	£'000s	£'000s	£'000s	£'000s	£'000s	£'000s
Balance at 1st January 1984	0·1	7·1	426·4	28·1	2·3	464·0
Investment Income	—	0·4	41·3	—	0·2	41·9
Additional Capital	—	—	0·4	0·2	—	0·6
Profit on sale of Investments	—	—	80·8	—	—	80·8
Transfer to Income and Expenditure Account	—	—	—	(0·7)	—	(0·7)
Transfer to Institute of Zoology	—	—	(32·3)	—	—	(32·3)
Balance at 31st December 1984	0·1	7·5	516·6	27·6	2·5	554·3

17. BUILDING AND EQUIPMENT FUND

	£'000s
Grants received during the year for the purchase of Fixed Assets	531·0
Transfer from Income and Expenditure Account	600·0
	1,131·0
Less: Transfer to Income and Expenditure Account	(19·8)
	1,111·2

18. PENSION FUND

At the last triennial valuation as at 30th June 1981, the Pension Fund showed a surplus of assets over liabilities and was solvent in terms of benefits to be provided on winding up. The Society made a contribution of £214,909 to the Pension Fund during the year.

19. SPECIAL FUNDS

(a) De Arroyave Fund

The capital of the fund is held by the Official Custodian for Charities. The net income of the fund was £12,896.

(b) Davis Fund

The capital of the fund is held in trust by the Society but is not included in the Balance Sheet. The income from the fund was £57.

20. CAPITAL COMMITMENTS

Expenditure Contracted	Nil	Nil
Authorised but not yet contracted	Nil	Nil

21. STATUS OF THE SOCIETY

The Society is incorporated by Royal Charter and a registered charity, No. 208728. It is exempt from United Kingdom Taxation.