



THE ZOOLOGICAL SOCIETY OF LONDON

Annual Report 1982

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. Research Laboratories and a modern Veterinary Hospital linked with a Pathology Department, which were established between the years 1956 and 1965, have greatly extended the scope of research which can be undertaken and sponsored 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 156 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 154th Annual Report to the Annual General Meeting of the Society to be held on 11th May 1983 at 4.00 pm in the Society's Meeting Room at Regent's Park.

CONTENTS

Report of the Council

Council 1982-1983	2
Honorary Fellows	2
Introduction by the President	3
Review of the Year	5
The London Zoo	7
Whipsnade Park	9
Scientific and Educational Activities	11
Research	14
Advisory and Consultant Services	18
General Matters	21

Appendices

1. Committees	24
2. Staff	25
3. Publications by Society's staff and research workers	26
4. Animals in the Collections	28
5. Donors of animals	48
Financial Statements	49

PATRON: HER MAJESTY THE QUEEN

COUNCIL 1982-1983

President: Professor Lord Zuckerman, OM, KCB, MD, DSc, FIBiol, FRS
Treasurer: Lord Buxton, MC, DL
Secretary: Professor J. G. Phillips, PhD, DSc, FRS
Vice-President: E. D. Barlow, MA, MB, BChir, FRCPsych, *Vice-President*
 E. M. Behrens
 Professor B. B. Boycott, FIBiol, FRS
 Professor W. S. Bullough, DSc
 D. L. Donne
 Professor R. J. Harrison, MA, MD, DSc, FRS
 R. H. Hedley, DSc, PhD, FIBiol, *Vice-President*
 Sir William Henderson, DSc, FRCVS, FIBiol, FRS, FRSE, *Vice-President*
 R. M. Laws, PhD, FRS
 The Hon. William McAlpine
 Professor N. A. Mitchison, DPhil, FRS
 C. J. Perrin
 Lady Daphne Straight
 The Hon. Sir Ronald Waterhouse, JP, MA, LLB, *Vice-President*
 H.G. The Duke of Wellington, MVO, OBE, MC, *Vice-President*
 W. L. Whitehouse, RD, MB, FRCS, FRCOG, FIBiol
 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
 1978 Professor W. E. Ankel, Friedrichstr. 19, Seniorenhotel
 'Amtsgericht', 6312 Laubach 1, West Germany
 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 Courier
 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 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
 1947 Professor G. G. Simpson, Department of Geology,
 University of Arizona, Tucson, Arizona 85721, USA
 1937 Dr E. A. Stensiö
 Naturhistoriska Riksmuseum, Stockholm 50, Sweden

Introduction by the President

The Society's financial problems, in parallel with those of many other public and private institutions, continued to worsen in 1982. Operating costs in 1981 had exceeded revenue by £1.15m. In 1982, the level of paid attendances remained virtually unchanged but, with costs continuing to rise, the deficit for the year reached £1.94m, an amount which represented a third of our total expenditure. A shortfall of this scale is to be greatly deplored, but it should be noted that it is nonetheless small relative to the average amount of help from public funds that other national zoos receive—as do also most of the world's better civic zoos—and none of which would have a chance of surviving as the institutions which they are unless they were subsidised.

Fortunately from the Society's point of view, the seriousness of what was happening was appreciated by the Department of the Environment and, as I noted in last year's Report, the Government had accordingly decided to 'make a grant to the Society of an amount sufficient to keep it in funds, having regard to available overdraft facilities'. This announcement was made in February 1982, at a moment when our bank loan stood at £1.8m, with the bank accepting as cover the securities that make up our Main Fund, together with the deeds of Whipsnade Park. A condition of the Government grant was that a study should be 'conducted with the utmost urgency into whether the Society can be made self-supporting in the longer term. The possibility of any further Government involvement at the end of the period will be for consideration in the light of the findings of the study and of the prospects of the Society becoming self-supporting'.

This study was carried out by Lord Chorley, a member of the Management Consultant firm Coopers and Lybrand, and by a senior official of the Department of the Environment. Professor Phillips (a member of the Council, who had been nominated as Secretary for the term beginning at the 1982 Annual General Meeting) represented the Society, but without commitment. The report of the study team was duly submitted in June 1982, and recommended that support of the kind to which the Government had agreed in February should be renewed as and when necessary, and that an Operational Plan for the three years 1983-84, 1984-85 and 1985-86 should be prepared. This Plan was to indicate those measures which would need to be taken if there were to be any chance of a turn-around in the Society's fortunes. The recommendation was accepted by the Government, which announced that, when completed, the Plan would be considered by Lord Gibson, Chairman of the National Trust and of S Pearson & Son, aided by representatives of the Department of the Environment and of Coopers and Lybrand. Lord Gibson would then recommend what, in his view, should be done.

To cover the period during which the Plan was being prepared, the Government approved a further grant to the Society to help it over the 1982/83 winter, when income would be at its lowest level in the year. The first grant of £900,000 was paid early in 1982, and a further £700,000 in December.

After some preliminary discussion, the Government asked the Council to prepare the Operational Plan. Work was started in October 1982, and completed by the beginning of February 1983, when the Report was presented to the Secretary of State for the Environment. The Plan is a very detailed and lengthy document which covers all aspects of the Society's activities. While Council organised and oversaw the work, and is alone responsible for what the Plan says and proposes, it wishes to express its deep appreciation to the Society's senior officials for the enormous amount of extra work which they undertook in its preparation. It also wishes to thank Miss Eirwen Owen, CBE, who came out of retirement to provide invaluable assistance in co-ordinating the Plan's separate sections. The Council is also grateful for the expert help given by members of its Committees and by others whom it consulted.

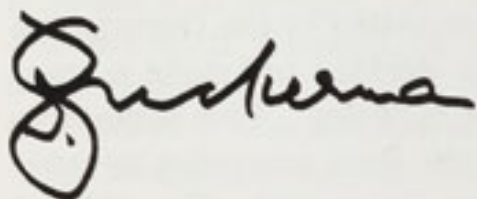
A small committee of Council, consisting of Members with wide commercial and banking experience, discussed with representatives of Coopers and Lybrand what help the latter could provide. The firm was then engaged as consultants for those sections of the Report which deal with financial and accounting issues, such as the allocation of costs, presentation of Accounts, the organisation of the Accounts Department, and the assessment of the financial consequences to the Society of the possible disposal of Whipsnade Park.

Negotiations with the Government are still proceeding.

The additional work that was entailed in the negotiations and in the preparation of the Operational Plan was not allowed to interrupt the normal run of the Society's activities. As the pages which follow make clear, 1982 was a successful year for every department other than that of catering at Regent's Park, the management of which was taken over in March, on very favourable terms to the Society, by Grandmet Catering Services Ltd. Unfortunately serious teething troubles were experienced by the new managers, at the same time as the change-over meant that the Society had to

meet a big bill for redundancy payments. Despite a halting start, Grandmet indicated its readiness to invest the capital that is required to pay for alterations in the layout of the main catering facilities in return for a five-year contract. This was agreed by Zoo Restaurants Ltd, the Society's wholly-owned subsidiary, through which it conducts those commercial activities which cannot be dealt with under our Royal Charter.

In conclusion, I should like to pay tribute to all those who have served on the Members Committee, for the splendid results of their efforts to raise funds for the Society. The Council would also like me to express its appreciation to all members of the Society's staff for their loyal and devoted service in very difficult times.



President

Review of the Year

Their Royal Highnesses the Prince and Princess of Wales

A message of congratulations and best wishes was sent by the President on behalf of the Council, Fellows and Staff of the Society to Their Royal Highnesses the Prince and Princess of Wales on the occasion of the birth of their son Prince William of Wales on 21 June, 1982.

Annual General Meeting

The Annual General Meeting was held on 12 May, with the President, Professor Lord Zuckerman, in the chair.

In accordance with Article 10 of the Charter, the President, Professor Lord Zuckerman, retired from office and the following Fellows retired as Ordinary Members of the Council: Lord Charteris of Amisfield and Sir Richard Way (Ordinary Fellows); Professor J. M. Dodd, Professor J. G. Phillips, Professor R. V. Short and Dr C. E. Gordon Smith (Scientific Fellows). The Secretary, Dr E. D. Barlow, also retired from office. He took over from Dr R. H. Hedley in June 1980 on the understanding that he would retire when the appropriate professional successor accepted the appointment.

Professor Lord Zuckerman was re-elected President. Professor J. G. Phillips was elected Secretary and the following Fellows were elected Members of Council: Dr E. D. Barlow, The Duke of Wellington and Sir Philip de Zulueta (Ordinary Fellows); Dr R. M. Laws, Professor N. A. Mitchison and Professor L. Wolpert (Scientific Fellows).

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 living animals, by a pupil under 19 years of age of a school in the United Kingdom) to *Jonathan Edward Greenland*, The Grammar School, Bristol, for his essay 'To study the effects of hydrogen ion concentration upon the excystment of the soil ciliate *Colpoda*'.

THE STAMFORD RAFFLES AWARD (awarded to an amateur zoologist for distinguished contributions to zoology) to *Lt-Col A. M. Emmett, MBE*, for his work on Microlepidoptera.

THE THOMAS HENRY HUXLEY AWARD (for original work submitted as a doctoral thesis) to *Dr N. R. Franks*, University of Leeds, for his thesis, 'The evolutionary ecology of the army ant *Eciton burchelli*, on Barro Colorado Island, Panama'.

THE SCIENTIFIC MEDAL (awarded to persons under 40 years of age for distinguished work in zoology) to *Professor M. P. Hassell*, Imperial College of Science & Technology, London, for his work on population ecology, in particular on arthropod predator-prey systems; and to *Dr J. R. Krebs*, Edward Grey Institute of Field Ornithology, University of Oxford, for his work on the behavioural ecology of birds.

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 *Sir Eric Smith, CBE, FRS*, for distinguished contributions to zoology through both research and administration.

Membership

At the end of the year, there were 2,541 Fellows and 4,463 Associates. The Committee of Members formed in 1981 under the Chairmanship of Lady Daphne Straight, with Mr W. Whitehouse as Secretary, expanded its activities and had a successful and profitable year. The Animal Sponsorship and Adoption Scheme, which was set up in February, was given good publicity by Press 'launches' in June at Regent's Park, and in November at Whipsnade. The Scheme has already produced some £30,000 net for the Society, and animals ranging from elephants to gerbils were adopted by 585 individual or group adopters.

The Committee again organized a number of social functions including a formal dinner in October on the occasion of the exhibition of the work of the sculptor, William Timym, a Carol Evening in December and lecture lunches once a month throughout the year. A competition to win a car presented by the Ford Company was also organized by the Committee and raised nearly £3,000 for the Society.

Some members volunteered for various tasks in the London Zoo. These included animal handling, running a brass rubbing centre, which provided brasses of endangered animal species, and manning an information centre. All these activities were designed to help to make a visit to the Zoo more interesting and informative.

The Society is grateful to its members for all their efforts in 1982.

Obituary

The Council records with deep regret the deaths of Professor Emmanuel Amoroso, FRS and Dr Raymond Greene, former members of Council, also of Mr Walter van den Bergh, former Director of the Royal Zoological Society of Antwerp, and a corresponding member of the Zoological Society of London. The Council also notes with regret the death of The Hon. Godfrey Samuel. He was instrumental in introducing to the Society, through the firm of Tecton, Mr Berthold Lubetkin who, in 1932, designed the Gorilla House (now the Great Apes Breeding Colony) and later the Penguin Pool; the latter now recognized worldwide as a landmark in the development of modern design.

Finance

As noted in the Introduction to this Report, the Secretary of State for the Environment announced early in 1982 an interim grant to the Society while a study was conducted of its financial prospects. The study was duly completed and the Society invited to prepare a three-year Operational Plan for the Government's consideration. A second interim grant was made in December.

While it did not live up to the improved economic expectations which had been widely forecast, 1982 was nonetheless a less calamitous year for the Society than either 1980 or 1981, when attendances fell sharply. In 1982 the number of visitors to Regent's Park was only 2% down. It could well have been the same, or even slightly better than in 1981 had it not been for the very bad weather in January; for the week-end rail strikes in the winter, and a longer one in the summer; and finally a ten-day London Transport strike in June. The London bombing incidents on 20 July (including one in Regent's Park itself), must also have deterred some potential Zoo visitors.

The fall in attendances at Whipsnade was greater than in London, but the decline of 12% can be almost entirely accounted for by the fact that the figure for 1981 included 40,000 extra

visitors, who that year came in free, or at much reduced rates, in celebration of the Park's Fiftieth Anniversary.

Admission prices were not increased in 1982. For the first three months of the year and as a further winter concession in December, they were reduced to the equivalent of the 'party rate'. The result was that attendances and income, at both Regent's Park and Whipsnade, were better than for the corresponding periods in 1981. The belief that standard admission prices, at Regent's Park in particular, are too high in relation to those of other attractions in London, together with the fact that admission to national museums is free, led the Council to approve a proposal for reducing standard prices throughout the year. On the advice of the Department of the Environment, this recommendation was not put into effect.

Attendances at both Zoos fell during the important spring and summer months, resulting in less income from admission charges than in 1981. Income from other visitor services also declined, by £140,000, partly because of an increasing tendency for visitors to spend less on catering and souvenirs, and partly because of the impact of redundancy payments involved in the transfer on 1 March of the management of catering services at Regent's Park from the Society to Grandmet Catering Services Limited. Operating costs during the year rose by 11%, close to the average inflation rate, despite the heavy burden of interest payments on the Society's bank overdraft, which remained at a high level throughout the year. The drop in income and the increase in expenditure led again to a rise in the operating deficit to £1,940,223. The interim grants of £1,600,000 paid to the Society by the Department of the Environment during 1982 reduced this to £340,223.

The following table of income and expenditure for the past four years shows that income in 1982 was back to the level of 1979, whereas expenditure has increased by 42%. Over the same period the Retail Price Index increased by 57%.

	1979	1980	1981	1982	% Increase/Decrease
Income (£000s)	3918	4261	4105	3926*	No change
Expenditure (£000s)	4129	4927	5257	5866	+42%
Deficit	211	666	1152	1940*	

*excluding Government grants

The operating deficit for 1982 is about 33% of total costs, a figure which is in the lower range of subsidies provided for other major world zoos by their respective governments or local authorities.

Grants, Gifts and Donations

Grants totalling £322,414 were received to support the work of the Institute of Zoology. The last of three annual grants of £4,000 from the British Library was made towards the cost of repairing and rebinding some of the rare and valuable books held in the Society's Library.

A generous gift of £20,000 was received from Mrs Marie Winstone and other gifts included £1,000 from The Simon Gibson Charitable Trust; an anonymous donation of £10,000 for improvements to animal holding quarters in the Animal Hospital; another anonymous donation of £743, and £40,520 raised by the

Members Committee. Mr Refoufi donated a seat in the Gardens in memory of his wife and many monetary gifts were made, either for the general purposes of the Society or towards the costs of feeding particular animals.

The following legacies were received: £500 from the estate of M. A. Gordon; £2,500 from the estate of Mr H. Kweiler; £5,000 from the estate of Mrs M. S. Maude-Roxby; and £5,000 from the estate of R. B. Priest.

Mr William Timym presented his sculpture of the Gorilla 'Guy' to the Society and also donated 40% of the proceeds of a sale of his works exhibited in the Tavern Room at Regent's Park at the end of October.

The Royal Botanic Gardens at Kew once again generously supplied plants for use at Regent's Park and Mr J. Berman presented another collection of orchids.

The London Zoo

Visitors during the year: 1,027,000

General

There were some notable occasions at the Zoo during the year. 'Bear Day' took place on 13 June, to mark the centenary of the birth of A. A. Milne, the creator of 'Winnie-the-Pooh'. Children were admitted free, provided they brought a 'teddy-bear' and were accompanied by an adult paying the normal admission charge. Some well-known actors, artists and authors took part and the day was a great success.

An exhibition of 'The World's Smallest Monkeys', featuring the collection of Marmosets and Tamarins in the Clore Pavilion, was opened in July.

In November, the larger-than-life-size sculpture of the Gorilla 'Guy', by Mr William Timym, was unveiled by the President.

Grandmet Catering Services Limited took over the management of all the catering facilities at Regent's Park on 1 March, under an agreement with Zoo Restaurants Limited. Further details are given elsewhere in this Report, but the change was made in the expectation that a professional organization with wide experience and substantial resources would be able to do better than the Society had done in recent years.

As reported above, admission prices to the Zoo were reduced to the party rate as a 'winter concession' during January, February, March and December. The results, despite some adverse weather and rail strikes at the beginning of the year, were satisfactory, showing a small overall improvement in income from visitors. A discount promotion in August, under which a child was allowed in free if presenting a voucher published in 'The Standard' newspaper and accompanied by an adult paying the normal admission price, was not as successful as had been hoped.

Two major BBC productions were filmed in the Zoo. The film 'A Day at the Zoo' by Miss Esther Rantzen was made in the spring and summer and shown on TV on 31 August. It was acclaimed by all as an excellent film and as an accurate and sympathetic portrayal of the Society's work. In September and October, filming took place for 'The Old Men at the Zoo', a TV feature from the novel by Sir Angus Wilson.

Two important international Zoo meetings held at Regent's Park in August were a meeting of the Captive Breeding Specialist Group of the IUCN Species Survival Commission, and a symposium of the International Union of Directors of Zoological Gardens on 'The Management of Rhinoceroses in Captivity'. Staff of the Society played a leading part on both occasions.

Buildings, Services and Grounds

Apart from a few minor improvements to exhibits, lack of resources once again restricted maintenance work to jobs necessary for the safe and efficient operation of amenities and services.

The Insect House, the Locust Breeding installations, part of The Parrot House, and the pig dens at the foot of the Mappin Terraces were re-wired. Safety work also continued in the Aquarium as part of the long-term programme to renovate and upgrade the electrical system.

The main heating lines of the centralized heating system, needed constant attention from Works Department staff because of a series of leaks, particularly during the severe weather conditions in January and February.

Remedial work included repairs to the concrete structures of the Mappin Terraces and the Wellcome Laboratories, and the

renewal of roofing on the Pavilion Building and the covered ways in the New Lion Terraces.

The renovation of the Reptile House roof which was started in 1980, was continued with the roofing and replacement of the skylights at the south end. Also at the south end of the House the crocodile exhibits were closed and the interiors demolished in preparation for re-construction in 1983.

Other improvements included a new enclosure for Red Pandas, constructed round an Ailanthus tree near the Elephant and Rhino Pavilion, sheds for sheep and pigs in the Children's Zoo Farm, and surfacing and drainage improvements for some Cotton Terraces paddocks. Two rooms in the Hospital were modernized for use as cagerooms, mainly for birds.

A different and more economical system of refuse collection, using small skips towed on a powered lift trailer, was commissioned early in 1982. A new gas fired incinerator has been installed to replace one in use since 1959.

The preparation and production of zoological information for the public, particularly the new Factual Animal Notices, made good progress under the direction of the Education Department.

A Turkey Oak in front of the Regent Building, probably more than a hundred years old and in full leaf, fell without warning; happily no-one was hurt nor was there any other damage. The Forestry Commission reported that the cause was a fungus which had rotted the base of the tree. Other such oaks are being checked.

New trees were planted along the Outer Circle and the northern boundary of the Zoo to replace elms and other trees which had had to be felled in recent years.

The Collection

MAMMAL SECTION

A number of interesting animals arrived in 1982. Among them was 'Dilberta', a baby Asian Elephant from Sri Lanka. She had been found abandoned in 1980, rescued, and taken to Colombo Zoo. While there she was accepted on behalf of the Society by HRH Prince Philip during his visit to Sri Lanka. 'Dilberta' was flown to London at the end of June by British Airways, whose Junior Jet Club adopted and named her. She is an intelligent Elephant and is responding well to the intensive training which she is receiving.

'Bulu', the first Orang-utan to be born and reared in Britain, was 21 years old on 12 March. The date was particularly notable for the captive breeding of this endangered species, because it coincided with the birth of 'Bulu's' grandson, 'Jago', the first Orang-utan to be born in Britain from two captive-born parents. The baby is being successfully reared by his mother 'Suka', despite the fact that she was herself hand-reared.

Other threatened mammal species also thrived at Regent's Park. A Gaur calf was reared, the first to survive in Britain. The birth of a Black Rhinoceros calf, named 'Esther' after Miss Esther Rantzen, and another calf born at Whipsnade, increased to 14 the number of animals of this species co-operatively managed by the major British Zoos. A female Pudu, the smallest species of deer, was born and reared, and one of the pairs of Golden Lion Tamarins received last year reared twins. Other threatened species which produced and reared their young included Przewalski's Horse, Onager, Leopard, Scimitar-horned Oryx, Bighorn Sheep, Mouflon, Markhor, and Jamaican Hutia. Many other births are listed in Appendix 4: noteworthy among these are five Beavers, three Asian Small-clawed Otters, two

Caracal Lynx, two White-faced Saki Monkeys, a Greater Kudu, two Ruffed Lemurs, and a Margay. All were successfully reared.

The Giant Pandas did not breed. The female came into heat late, briefly and at low intensity. Although the animals shared some pre-mating behaviour, no mating took place. This behaviour does, however, give more hope for next year. During April the female Giant Pandas at Washington and Madrid Zoos were inseminated with semen from the London Zoo male. The female at Madrid Zoo became pregnant and gave birth in September.

The pair of Okapi also failed to mate. A larger male was therefore brought to Regent's Park from Bristol Zoo, to see if he would do better than had the smaller animal, 'Papyrus'.

Several important changes were made in the mammal species kept at Regent's Park. The Waterbuck, African Buffalo and Gemsbok groups were sent to Whipsnade to make room in Regent's Park for a breeding group of Roan Antelope, and to provide more space for breeding Przewalski's Horses and Greater Kudu. The Wart Hogs, which to thrive need ample space, were also transferred to Whipsnade, and the group of Gelada Baboons, which had not done well recently, was disbanded. Some species not seen at Regent's Park for many years were acquired, among them a trio of Hartmann's Mountain Zebra which are jointly owned with Marwell Zoo, a pair of Brazilian Tapirs deposited by Chester Zoo, and a pair of Vicuna deposited by Antwerp Zoo.

Several other species brought in from overseas had to undergo the statutory six months in rabies quarantine. These included a pair of Pygmy Marmosets born in Stockholm, a studbook-registered female Sumatran Tiger, four Byrne's Pouched Mice from Antwerp Zoo, six Striped Grass Mice and three Green Acouchis from New York Zoo, a pair of Tasmanian Devils, and two colonies of Naked Mole Rats from Kenya.

The opportunities for contact between the public and suitable animals were increased in various ways. A spoken commentary to accompany the Sealion feed was instituted. The baby Elephant 'Dilberta' was walked regularly through the Zoo by her keepers, as were a newly acquired Alpaca and three young Reindeer. A baby Chimpanzee whose mother died when he was nine weeks old, and a baby Saki Monkey abandoned by his mother after five weeks, were both hand-reared and introduced to visitors and the media.

The amount of riding was increased. More than 176,000 rides were given, on Camels, in a Pony trap, in Llama carts, and on Ponies and Donkeys.

BIRD SECTION

Eight more species bred during the year 1982 than in 1981, and at least three were of particular interest. The hand-rearing of an Andean Condor and Tarric Hornbills, and the breeding of Blue-crowned Motmots, were first-time successes for this Collection.

The Andean Condor laid her single egg on 19 March, and after 11 days it was removed to an incubator and kept at a temperature of 37°C. On 20 May the egg hatched. The chick, which weighed 200 g, was at first fed four times a day on a specially prepared liquidized food. As she grew, beef, horse meat and whole mice were added to the diet. At 12 weeks old she was feeding herself and by 27 August she weighed 7.7 kg. She is the first condor to be successfully reared in this country.

The female Tarric Hornbill, though still being fed by the male, abandoned her three eggs which were immediately taken to an incubator. Some days later two hatched. The two chicks,

blind and almost naked at hatching, were hand-fed at least six times a day. They grew rapidly on their diet of fruit and insects, and were fully fledged at seven weeks. So far as we know, this is the first time in the world that the eggs of Tarric Hornbills, indeed of any hornbill, have been artificially incubated and the young reared.

In the Bird House the Blue-crowned Motmots used the earth bank in their aviary to excavate a tunnel in which eggs were laid. In July, two almost fully grown young appeared at the tunnel entrance. This was the first time the species has bred in this Collection.

Other breedings included owls (Snowy Owl, Boobook Owl, Little Owl, Abyssinian Spotted Eagle Owl and African Spotted Eagle Owl), Black Bulbul, Moustached Laughing Thrush, Abdim's Stork, Black-footed Penguins, and a number of ducks, geese, pheasant and quail.

Last year all the young Chilean Flamingos that had been reared were killed, almost certainly by Herring Gulls. After careful observation, those gulls thought to be the 'rogue' individuals were removed. No predation occurred this year and three flamingos were successfully reared by their parents. Nevertheless more information is needed on all the gull species which come into the Zoo and a survey of their numbers, distribution and movements is therefore being made.

Interesting species brought into the collection included Maguari Storks, Koklass Pheasants, Swainson's Toucans, Blue and White Flycatchers and a pair of hummingbirds, the Fork-tailed Woodnymphs. A large group of Barraband, Rock Peplar and Princess of Wales' Parrakeets joined other Australian birds in the refurbished Clock Tower Aviary. All belong to the genus *Polystelis*. They are particularly handsome birds and are the only Australian Parrakeets which can be kept in a colony during the breeding season.

The Sulphur-crested Cockatoo, 'Cocky', who had been in the Collection since 1925 and was at least 82 years old, died in October. He was a bird of considerable charm and character and will be much missed by many people.

REPTILE SECTION

Twenty-one species were bred during the year, including two species from individuals which were gravid when they arrived, and one species which hatched from eggs given to the Collection. Of particular interest was the successful breeding of Chuckwallas, the first time this species of lizard has bred in captivity other than in collections within its natural range in the southwest of the United States. Copper-tailed Skinks and Knysna Dwarf Chameleons also bred for the first time in this country. Indian Rock Pythons had not been bred here since 1952, though last year a female had a caesarian operation to remove eggs blocking the oviduct. This year she laid eggs which were removed for artificial incubation. Five subsequently hatched.

Interesting species acquired included: Tiger Snakes, Carpet Pythons and Copper-tailed Skinks from Taronga Zoo, Sydney; Children's Pythons, Eastern Blue-tongued Skinks and Stump-tailed Skinks from Melbourne Zoo; Sinaloan Snakes from San Diego Zoo; and a female Gila Monster on deposit from Chester Zoo. An African Spurred Tortoise and a Mexican Beaded Lizard were sent to Chester.

Laparoscope techniques were used to determine the sex of a number of lizards so enabling them to be placed in breeding groups.

Whipsnade Park

Several cages were completely redecorated to produce more natural-looking backgrounds. The balcony area of the Reptile House was closed for essential maintenance work. It is to be redesigned and refurbished to give larger quarters for the Chinese Alligators and Broad-fronted Crocodiles.

A new data recording sheet, designed by Senior Keeper D. Risley, is being used to record essential baseline information on incubation and rearing. Overseer D. Ball visited 12 reptile collections in the United States, where he also presented a paper to the Sixth Symposium on Reptile Captive Breeding and Husbandry. He was also a guest speaker at the National Zoo in Washington, D.C.

AQUARIUM

Consignments of marine fish were obtained from Blackpool Aquarium and Torquay Aquarium, and included Conger Eels, Ballen Wrasses, Cuckoo Wrasses, and Sea Scorpions. Among the freshwater fish presented were various catfish and loaches, a Gar Pike, and a number of *Betta macrostoma*, a rare relative of the Siamese Fighting fish. An Electric Eel, an example of which has not been in the Collection for more than a year, was obtained. Six Burbot, a species probably now extinct in Britain, were imported from Sweden but did not survive; neither did four Leopard Sharks from California. A report has been prepared on the intermittent failures in the services to the Aquarium, since the increasing difficulties in obtaining fish make it imperative that these faults are prevented in order to protect the Collection. Improvements to the Amphibian tanks were continued, and several newts, tree frogs, and bull frogs were presented.

INSECT HOUSE

The House was closed for a few weeks for rewiring, and as a result the number of locusts bred to feed other animals was temporarily reduced.

As usual, all the fifteen species of stick-insects and mantises and most of the dozen species of spiders were bred. Animals were supplied to schools and universities, and others lent for animal handling demonstrations.

Professor Bryan Clarke sent a consignment of the small *Partula* snails. The species is threatened in Polynesia by the introduced predatory snail *Euglandina*, a few of which were also received.

A project to rear beetles was initiated, and a few exotic beetles obtained.

Visitors during the year: 345,500
Cars brought into the park: 43,000

General

Whipsnade weathered the adverse economic conditions of the last few years remarkably well, but in 1982 attendances declined by 12% as compared with 2% in 1981 (as mentioned on p. 5 the 1981 figures were unusually high because of the extra visitors who took advantage of the concessions to mark Whipsnade's Fiftieth Anniversary).

As at London Zoo, there were reduced admission prices for the months of January, February, March and December. When weather conditions allowed, attendances and overall income improved slightly.

In recent years Whipsnade has become a popular venue for outdoor charity occasions. In 1982 there were two; a 'fun run' to help the Cancer Research Association and a sponsored walk on behalf of the World Wildlife Fund. Such occasions are only made possible by the work of Whipsnade staff who help with the arrangements.

The Animal Sponsorship and Adoption Scheme, run by the Members Committee, was launched for Whipsnade on 6 November with a public appearance by Eric Morecambe, the TV comedian.

Although no major building works took place during the year, some necessary improvements were made in addition to normal maintenance work. A long section of the main water supply line was replaced; some renovation of the White Rhino House was carried out; changes were made to the animal houses serving the Central Paddock and the African Plains area so that Dwarf Cape Buffalo and Wart Hog could be transferred from Regent's Park; the outside enclosure of the Chimpanzee House was repainted.

The Collection

The severe weather in January caused heavy casualties among the free-roaming wallaby population. It also led to the escape of a Red Panda which climbed out of its enclosure over a pile of drifted snow and was caught next morning a mile and a half away near Dunstable, its bright colour showing up against the white landscape.

The list of births and hatchings is recorded in Appendix 4. Some breeding successes are particularly noteworthy. Wattled Cranes bred for the first time in Britain—three young being hatched—and a Red-crowned Crane chick was also hatched. The Park's considerable crane collection was also increased by the deposit from other zoos of a White-naped Crane and two Lesser Sandhill Cranes. All the penguin species, Humboldt's, King and Rockhopper, bred during the year; the Humboldt's Penguin flock hatched fifteen young. Another Black Rhinoceros was born, the fifth calf to the resident female but only the first to the male, an animal which came to the Society's Collections with the reputation of being a non-breeder. This brings to 10 the number of Black Rhinos that have been bred, at both Regent's Park and Whipsnade, over the past 15 years. The establishment of a good stock in Britain makes an important contribution to the conservation of this now threatened species.

A number of acquisitions were made to strengthen the antelope collection and enhance Whipsnade's importance as one of the two main centres in Britain for breeding ungulates. Common Waterbuck, Gemsbok, Scimitar-horned Oryx, Dwarf Cape Buffalo and Grevy's Zebra arrived either to re-inforce existing groups such

as the Scimitar-horned Oryx and Common Waterbuck or to form the nucleus of new ones. The Dwarf Cape Buffalo, which are owned and managed jointly with the Marwell Preservation Trust, were transferred from Regent's Park, as was the pair of Wart Hogs. The Blesbok herd was improved by the importation of four new animals from the Continent and the Przewalski's Horse herd by a stallion from Munich Zoo. The arrival of three Grevy's Zebras from Marwell was the first stage in re-establishing a herd at Whipsnade; they will replace the Common Zebras at present kept as representatives of the zebra family, and will complement the Hartman's Mountain Zebra species now at Regent's Park.

Two Southern Sealions were sent on deposit to the Blackpool Zoo in accordance with the arrangements made with other leading British zoos to encourage breeding.

Other transfers from Whipsnade included four Przewalski's Horses which were sent to the Australian zoos of Dubbo (Sydney's 'Whipsnade') and Melbourne. They were part of a consignment of eight from British stocks intended to found a breeding group of these horses in Australia. Eight Chinese Water Deer were sent to the Winnipeg Zoo; and fourteen Bennett's Wallabies to the new national zoo in Algiers. Two Przewalski's Horse stallions have been deposited at Woburn Park, where a male herd of this species will be kept, thus helping to solve the problem of surplus males in British collections.

Two notable Whipsnade animals died. One was 'China', a Chimpanzee who was a member of the last 'Tea Party' group of animals at Regent's Park. She arrived at Regent's Park in 1965 and was transferred to Whipsnade in 1969. The other was the Pygmy Hippopotamus 'Joe', born in the Brookfield Zoo at Chicago, which arrived at Whipsnade in 1969, and where he fathered seven young.

Scientific and Educational Activities

Scientific Meetings

Eight scientific meetings were held in 1982. In February Professor M. Peaker organized the sixth in the series 'The scientific basis of wild animal husbandry', on the subject 'Survival of neonatal animals'. Professor Peaker spoke on 'The control, success and failure of lactation'; Mr D. M. Jones on 'Neonatal survival at Regent's Park and Whipsnade'; Professor J. P. Hearn on 'Contrasts in lactation and its control of reproduction in marsupials, monkeys and man'; and Professor R. V. Short, FRS, on 'Lactation in great apes'. In March Dr C. F. Mason gave a paper on 'Decline of the otter'. The speakers at the April meeting were Mr G. J. Howes, on 'Jaw structure and evolution in Indian carps'; Dr R. A. Travers on 'Spiny eels of Africa and Asia'; and Dr L. R. Parenti on 'Killifishes of the Andes'. In May Dr R. H. Lander spoke on 'Pribilof fur seals: research and management', and Dr N. R. Franks, the winner of the Thomas Henry Huxley Award in 1981, on 'The search patterns of swarm raiding Army ants in a neotropical rain forest'. The June meeting was on the theme 'Reproduction in New World monkeys and man', and comprised papers by Dr A. F. Dixson on 'The brain and behaviour', Dr H. D. M. Moore on 'Reproduction in the male' and Professor J. P. Hearn on 'Reproduction in the female'. In October, after a talk by Dr J. P. Croxall on 'Reproductive and foraging strategies in albatrosses at South Georgia', Miss Cindy Buxton presented her film 'Penguin Island', on wildlife of the Falkland Islands. Dr E. A. Robson spoke at the November meeting on 'The nervous system of Onychophora', and Professor E. R. Trueman on 'The jet swimming of siphonophores and salps'. The December meeting was arranged by Dr K. A. Joysey on the subject 'Fossils and molecular evolution in mutual perspective'; his paper on this topic was amplified by contributions from Dr A. M. Lister on 'Tracing micro-evolution: the Red deer as a case study' and from Dr V. C. Joysey on 'White cell blood groups and natural selection'. The Society is most grateful to all the speakers who contributed to the 1982 programme of meetings.

Symposia

A symposium on 'Physiological strategies in lactation', organized by Professor M. Peaker, Dr R. G. Vernon and Dr C. H. Knight, was held on 11 and 12 November.

Publications

Journal of Zoology Volumes 196, 197 and 198 were published, and together contain 115 papers. The Council greatly appreciates the work of the many referees who help in the assessment of the very large number of manuscripts submitted for publication, and would like to thank them for their generous assistance.

Transactions Two parts were published: Volume 36, Part 2, 'The structure and composition of the eggshell and embryonic membranes of *Alligator mississippiensis*' by Mark W. J. Ferguson, and Volume 36, Part 3, 'The functional morphology of *Parilimya fragilis* (Bivalvia: Parilimyidae nov. fam.) with a discussion on the origin and evolution of the carnivorous septibranchs and a reclassification of the Anomalodesmata' by Brian Morton.

Symposia Two volumes were published: No. 49, 'Telemetric studies of vertebrates', edited by Dr C. L. Cheeseman and Mr R. B. Mitson, and No. 50, 'Animal disease in relation to animal

conservation', edited by Dr Marcia A. Edwards and Miss Unity McDonnell.

Zoological Record

Volume 116 (1979 literature): The complete volume was published in December.

Progress continues to be satisfactory and volumes are being completed on schedule. Indexing is now in progress for Volume 118 (1981 literature).

The second meeting of the Zoological Record Advisory Committee took place on 21 and 22 October at the Philadelphia headquarters of BIOSIS (BioSciences Information Service). Professor Gordon was in the Chair and the activities and progress during the previous 12 months were reviewed. Prior to the meeting, members of the Committee were privileged to be invited to the celebrations for the dedication of the new BIOSIS building. A symposium on 'Information for the Advancement of Science' was held at which Professor Barrington presented a paper on 'The importance of information for creative biological research'.

An important development began in the autumn, when, for the first time, the *Zoological Record* became available on line. The machine-readable version of the printed volume is accessible through the DIALOG Information Service system and contains items corresponding to Volume 115 (1978 literature) of the *Record*. The file will be updated at bimonthly intervals during 1983, in order to provide access to more current literature.

The Council is indebted to the Board of the British Library and the Director General of its Lending Division, for access to the library at Boston Spa, and to the Trustees, Director and staff of the British Museum (Natural History) for accommodation and advice.

International Zoo Yearbook

Publication of the *International Zoo Yearbook* was again delayed and Volume 22 was not expected to be available until the beginning of 1983.

The theme for Section 1 of Volume 23, 'Birds of prey', is likely to attract a wide audience since it is a topic of great interest and ever-increasing concern to a rapidly expanding range of organizations and professional people. The section has been compiled with the advice of Dr B-U Meyburg, chairman of the ICBP Working Group on Birds of Prey, and John Cooper, international expert on veterinary aspects. The papers give a comprehensive, international view of the current situation, and discuss the protection, maintenance and perpetuation of these magnificent birds in the wild as well as in captivity. A wide range of birds of prey is considered, including eagles, hawks, buzzards, falcons, vultures and owls. The problems of captive breeding and management of a variety of species are reviewed. The section also gives details of release schemes, the possibilities for reintroduction and rehabilitation of particular species, registration and marking techniques, and an up-to-date review of veterinary problems.

Section 2, 'New developments in the zoo world', contains an excellent selection of papers from all over the world on breeding, hand-rearing, husbandry, housing, and research on a variety of reptile, bird and mammal species.

The reference section lists the numbers and species of vertebrates bred in captivity during 1981, the census of rare animals in captivity and the list of studbooks for rare or endangered species in captivity.

The Library

During the past year the Library has continued to provide a service to Fellows of the Society and to Library Ticket holders. A full library service has also been provided to the scientific staff of the Society and for that purpose books and journals have been borrowed from other Libraries. In return the Library has lent volumes and supplied photocopies of papers to academic and specialist libraries throughout the country.

There has been a growing demand for the Library Reference Tickets, details of which were given in the last Annual Report. The Library has also answered many requests for information from the public. Material from the Society's archives and from the collection of graphic material has been lent to various exhibitions, such as the Joseph Wolf exhibition in the Tryon Gallery and the exhibition 'Zoos', mounted by the Institute of Contemporary Arts.

The money available for the purchase of new books has been restricted, due to the economic situation. The Society is therefore most grateful to all those who have generously donated volumes to the Library. Among these are Mr A. W. Baker, Dr E. D. Barlow, Professor W. S. Bullough, Mr M. J. Chapman, Professor Stacey B. Day, Dr Jesus Diaz de Castro, Mr Laurie A. Heizler, Professor J. R. Napier, Professor Dr med. G. Pilleri, Dr C. A. Spinage, Professor Dr Anthonie Stolk, Mr Wolf Suschitzky, Mr G. L. Wood and Professor Lord Zuckerman.

Education Department

PROGRAMME FOR SCHOOLS

The development and expansion of the programme has been made possible by the presence of teachers seconded by local education authorities for service in the Society's Education Department. Mr J. M. L. Down was seconded throughout the year from the Inner London Education Authority and Mrs F. A. Rogers from September onwards. Mrs Rogers is a trained primary teacher, and is helping to improve the quality of the work with younger children. The Bedfordshire Local Education Authority seconded Mr M. Knight for service at Whipsnade during the summer term. The additional skilled help thus provided has enabled the Department to continue to develop the services to schools conducted by trained teachers, as well as to devote more time to the volunteers. Additional training was given to the volunteers who conduct tours for small primary school groups and this programme, first introduced during 1981, continued to expand satisfactorily. Other programmes also attracted more pupils, helped by the fact that there was no increase in the charge made for educational visits. That growth is still possible when school rolls continue to fall, and in the present economic climate, is an indication that the Society's educational work is soundly based and continues to meet a real need.

Attendances were as follows:

Regent's Park:	Spring Term	22,003
	Summer Term	19,791
	Autumn Term	19,585
Whipsnade Park:	Summer Term	5,179
	Total	66,558

This total is the highest ever achieved in a single year, being 21.6% higher than that for 1981. It includes:

Pupils of primary school age, taught by auxiliaries	8,132
Pupils of primary school age, taught under other programmes	11,880
Pupils of secondary school age	45,601
Students from universities, polytechnics, etc.	945
Total	66,558

As is customary, these figures include only those pupils and students who took part in the programmes organized by the Society's Education Department. Help was also provided for some teachers and lecturers who prefer to instruct their own students during visits to the Zoo.

The Society is grateful to the Inner London Education Authority and the Bedfordshire Local Education Authority for the generous secondment of staff and to the auxiliaries who freely gave their time to teach primary school children.

OTHER COURSES AND EVENTS

Two Sixth Form Symposia were held during the year. In January a symposium entitled 'Recent advances in biological research' was organized jointly with St. John's College, Cambridge, and chaired by Professor P. A. Jewell. The speakers were Dr R. N. Perham of St. John's College, Mr D. G. Morgan of St. John's College, Dr B. Bertram of the Zoological Society of London, Professor R. A. Hinde of St. John's College, Dr F. W. Campbell of St. John's College, Robert Hess and Ian Boyd, students of St. John's College. In December a symposium on 'Darwinism Today' was chaired by Mr D. J. Stanbury. The speakers were Dr J. S. Jones of University College, London, Dr N. H. Barton of University College, London, Professor T. L. Blundell of Birkbeck College, Dr P. H. Greenwood of the British Museum (Natural History), Dr T. S. Kemp of Oxford University, and Dr A. F. Dixon of the Institute of Zoology, Zoological Society of London. Both symposia were fully booked, and altogether about 500 pupils from all over south-eastern England attended. This total is additional to those taught under other programmes. A two-day course on the educational use of zoos was organized for teachers from the Inner London Education Authority. It was held at the end of the school Easter vacation, and 44 teachers took part.

The Education Officer attended a conference of British Zoo Education Officers at Chester in May, and the biennial conference of the International Association of Zoo Educators at Tucson, Arizona, in September, reading a paper on each occasion. While in the United States he studied the methods by which some zoos are interpreted to visitors. The zoos he visited were the San Diego Zoo; the San Diego Wild Animal Park; the Arizona-Sonora Desert Museum; Tucson Zoo; Denver Zoo; Minneapolis Zoo; the Brookfield and Lincoln Park Zoos and the Shedd Aquarium in Chicago; Cincinnati Zoo; the Bronx Zoo, New York; and the New England Aquarium, Boston. The Society is grateful to the British Council for making a grant towards the cost of this study.

Three meetings were held in the period immediately after Christmas. They were an 'At Home', at which some of the Society's staff and animals provided entertainment, 'The Making of Life on Earth', when Dr John Sparks of the BBC spoke about the production of the famous television series, and a showing of the film 'It's a long way to Umfolozi'. All of these meetings were well attended.

YOUNG ZOOLOGISTS' CLUB

Membership of the Club continued to increase and now stands at 3,224. Three issues of *Zoo Magazine* were produced. Meetings for members, held during the school holidays, included a demonstration on the care of invertebrates, a safari to the National Gallery, visits to Whipsnade Park and Marwell Zoos, and to the Butterfly House at Sion Park.

PROVISION OF INFORMATION FOR THE PUBLIC

More animal information signs were produced including special signs for the exhibition 'The World's Smallest Monkeys', which is referred to earlier in this Report, and experimental new signs for the Children's Zoo at Regent's Park. Work began on an entirely new *London Zoo Guide*, to be introduced in 1983.

Volunteers from the membership of the Society were given training to enable them to help the public visiting the London Zoo. These volunteers manned an information bureau, sold season tickets, gave short talks to visitors, conducted demonstrations of animal handling, and ran a brass-rubbing centre, the profits from which benefited both the Society and the World Wildlife Fund. Altogether 43 volunteers took part in this programme, which will be developed and expanded in 1983.

Research

THE INSTITUTE OF ZOOLOGY

The Zoological Society of London has carried out and encouraged scientific research and discussion since its foundation in 1826. The research of the Society's scientific staff is designed to make full use of the unique opportunities afforded by the Collections of exotic species in order to gain knowledge that will help in the improvement of animal and human welfare. The Institute's objectives are:

1. *Basic science*: To advance fundamental knowledge of zoology and animal physiology.
2. *Conservation*: To improve the diagnosis and treatment of disease, the breeding and management of animals in captivity and in the wild.
3. *Comparative medicine*: To apply the findings from research to medical and agricultural science.
4. *Education*: To pursue an active teaching and training programme at undergraduate, postgraduate and postdoctoral levels (in addition to the Society's comprehensive programmes for school children).
5. *Collaboration*: To act as a resource centre in working with up to 200 other institutions in joint projects or in the supply of research materials.

The Institute comprises the Nuffield Laboratories of Comparative Medicine, the Wellcome Laboratories of Comparative Physiology, the Animal Hospital and the Curators' Research Units. There are approximately 100 members of staff, 30 at PhD level. At any one time there are up to 80 research projects under way and the Institute publishes about 100 scientific papers each year.

A full account of the research carried out by the Society's staff is published in the Scientific Report (1979-1981) which is available on request. More than half of the costs of the research staff and projects are covered by grants from the Research Councils and other agencies. The remaining costs are met by the Society and support both the Veterinary Department in its care and treatment of the animals and the work of the scientific departments that is essential for and directly applicable to the management and breeding of animals in captivity and in the wild.

Research programmes are coordinated between seven departments:

Veterinary Science

Mr D. M. Jones, Mr V. J. A. Manton and Mr J. A. Knight are responsible for the veterinary care of the animals in the Collections and in the Institute of Zoology.

REGENT'S PARK

During the year 752 animals from the Collections and 382 from the Institute were examined clinically, either in their quarters or in the Animal Hospital. A further 200 patients were referred from private practice. 759 post mortem examinations were performed including 48 external cases.

The standards of health within the Collections remained high throughout the year, the most difficult problem being an outbreak of Listeriosis in the Institute's marmoset colonies. Strict isolation and rapid treatment of the contact animals quickly brought this under control.

The Department worked closely with the Ministry of Agriculture, Fisheries and Food to find an acceptable way of testing and quarantining ungulates born in Europe which are needed for the major zoos in Britain. In June 1982 a building on Southampton

Docks was modified and used to quarantine a variety of ungulates including Blesbok, Dama Gazelles and Sable Antelope.

During 1982 the clinical research programmes continued and considerable assistance was given to other workers in the Institute who required samples or needed help in veterinary procedures. Mrs Jann White joined the Department to study the nutritional and energy requirements of a range of animals. She is working closely with the Department of Nutrition. In conjunction with the Department of Infectious Diseases, the pathology section staff are examining the role of anaerobic bacteria in necrobacillosis of macropods; and with the London School of Hygiene and Tropical Medicine they are studying the incidence of viruses in liver disease and in tumours of rodents and primates.

Dr J. Samour joined the Department as a grant-supported postgraduate research worker. In a very productive period of work, he sexed almost all the larger birds where the sex remained uncertain at Whipsnade, London, Chester, Bristol, Edinburgh and Marwell Zoos. This enabled a number of exchanges and deposits to be made so that potential breeding pairs could be established. The technique involves the use of small fibre optic telescopes used to examine either, the gonads or cloacal papillae.

WHIPSNAD PARK

The post of Veterinary Officer at Whipsnade remained vacant throughout the year, the Curator carrying out most of the routine clinical care of the Collection. The Whipsnade stock continues to be very healthy, but routine care does require a full-time veterinarian and the post will be filled shortly.

Eighty-three clinical cases were examined and 468 post mortem examinations were carried out. Nematode parasites caused a number of deaths in newly introduced antelopes, fortunately only in those from the reserve herds of males. The new, very potent antihelmintic Ivermectin was used frequently during the year but the drug may be so effective for ruminants kept continually on grass, that it leaves the animal without any immunity and apparently highly susceptible to re-infection. This problem is being examined further.

HAEMATOLOGY

Dr Christine Hawkey and Mr M. G. Hart continued a diagnostic service for the Zoos. Blood samples were collected from more than 600 normal birds undergoing laparoscopy for sex determination at Chester, Edinburgh, Bristol and Marwell Zoos, providing a unique chance to establish reference values. Values were also established for African Grey Parrots, Manchurian Demoiselle and Crowned Cranes, Common Marmosets, Red-bellied and Cotton-top Tamarins, Red-necked Wallabies and Yaks, and the response of the blood to various diseases in these species was studied. Possible cases of 'Wasting Marmoset Syndrome' were identified in Common Marmosets, Red-bellied and Cotton-top Tamarins and were investigated by Mr R. Elliott from Paddington Technical College.

Mr P. C. R. Pearce concluded his investigation of thyroid hormones and the causes of a heart disease known as hypertrophic cardiomyopathy. He found that changes in membrane permeability were responsible for the disarray of muscle fibrils seen in rats suffering from the disease.

Genetics

Dr D. B. Whitehouse, Miss Wendy Putt, Miss Lyn Elliston and Miss Alice George developed a number of new systems that will

aid the breeding of endangered species. Studies were concentrated on the genetics of horses and primates.

A new system using isoelectric focusing and immunological detection of serum proteins gave better precision in identifying proteins in serum. The method increased the number of gene products that can be studied and thereby improved paternity testing procedures and the genetic counselling on which breeding policies can be based.

The Department continued to work with the British Zoos Anthropoid Ape Advisory Panel, helping to monitor the captive breeding of Chimpanzees, Gorillas and Orang-utans in the United Kingdom.

Studies of Przewalski and domesticated horses continued and two new gene markers were found. The results clarified some uncertainties in the stud book entries and verified others. In order to define the position of particular genes on particular chromosomes, a bank of Przewalski Horse/hamster cell clones was produced. This work should confirm linkage between particular genes and may allow some genetic abnormalities to be assigned to individual chromosomes. A chromosomal abnormality known as centric fission was found in a male Common Zebra and its presence was then explored in the family of that animal. The abnormality was found in three generations of the family and its occurrence may explain the high rate of abortions or perinatal deaths in the family. Breeding policy will avoid transmission of this abnormal chromosome in future in this group of animals.

The possibility that genetic factors might explain recent deaths of young Mouflon was examined, but the results showed very little genetic variation between three different Mouflon flocks, including the flock at Regent's Park, and it is felt that biochemical investigations alone cannot solve this problem.

In a joint project with Dr H. D. M. Moore of the Department of Reproduction and Dr E. Simpson, of the MRC Clinical Research Centre, the possible existence of male specific antigens is being evaluated. The studies are aimed at understanding the expression of male characters early in embryonic life. If successful, this approach will provide a method of determining the sex of early embryos and of animals where the sex is not apparent, for example in many birds and reptiles. During the year, genetic techniques of karyotyping were used to determine the sex of 21 individuals from 15 species of birds.

Infectious Diseases

Dr G. R. Smith and Mrs Janet Oliphant studied the complex relationships between two strains of mycoplasmas that cause a pleuropneumonia in ruminants. They found that vaccines raised against the first of these strains would provide immunological protection against both, but that the reverse did not hold. Consequently the broadly acting vaccines raised against the first will be developed in future. A joint project was initiated with laboratories in Kenya to examine the problem further under field conditions.

In a study with the North West Water Authority, certain mud-banks in the Mersey estuary were found to be heavily contaminated with *Clostridium botulinum* type C, the cause of avian botulism. This was interesting because of recent heavy mortality among birds in the area, the cause of which was suspected to be lead poisoning. Six of eight gulls examined probably died of botulism, although the amounts of toxin in their blood was low. Earlier studies showed that the type C organism is not generally found in aquatic environments in Britain.

A project was started to investigate the cause of necrobacillosis, a serious disease found in kangaroos and wallabies both in captivity and in the wild. A number of strains of anaerobic bacteria were examined and it appears that *Fusobacterium necrophorum* is the major cause of the disease. Preliminary development of a vaccine against the disease shows that several major problems need to be overcome before an effective vaccine can be produced.

In the Immunoassay Unit Drs A. Voller and D. E. Bidwell continued their work on sensitive methods for diagnosis of diseases in man, animals and plants. They established ELISA methods for C-Reactive Protein—which can be used to monitor post-operative complications. They also developed methods using antibodies labelled with colloidal gold as simple aids to diagnosis. Within the Institute, collaborative projects were set up with the Department of Reproduction in order to develop novel hormone immunoassays for rapid monitoring of the reproductive condition of exotic animals.

Nutrition

Professor M. A. Crawford and his colleagues extended their studies on the nutritional requirements of species that suffer high loss of young in captivity. In a joint project with Miss G. Lewis from the Central Veterinary Laboratory in Weybridge, Mr G. Williams analysed the vitamin A content of livers from wild and captive dolphins. Considerable variations were found between individuals but dolphins that died in captivity or after inadvertent beaching had lower levels than did free-living animals. On the other hand, studies in collaboration with Dr J. Scott from the National Institute for Research into Dairying, Reading, showed captive dolphins to have higher liver concentrations of vitamin B, nicotinamide, pantothenic acid and riboflavin. Further analysis of the needs of captive dolphins for vitamin A are in progress.

Dr W. Hare, Miss Beverley Hine and Mrs Jann White investigated the nutrition of Mouflon in Regent's Park where deaths among young are higher than at Whipsnade. They found that the animals might be suffering from a deficiency in vitamin E. A number of alternative diets were then designed and tried out, with a result that growth and development of the young Mouflon improved. Studies are now under way on a broader nutritional basis.

A major project continued in exploring the relationships between essential fatty acids (EFA) and the synthesis of the prostaglandin hormones. Dr S. Cunnane developed new methods for measuring the rate of synthesis, using lymphocytes, and made improvements on the more usual method which involves measurement in rat liver tissue. Mr D. Kuhn and Miss Pamela Stevens carried out radioactive tracer studies in perfused human placenta, finding that prostaglandin synthesis was limited by the different pools of lipids that exist in the placenta, only one of which appears to be destined for synthesis of these hormones. The results of this work clarify the role of essential fatty acids on prostaglandin production and also the important functions of the prostaglandins in the placenta around the time of birth when they are selectively released in considerable quantities into the maternal but not into the foetal circulation.

Professor P. Budowski, on a visit from the University of Jerusalem, Dr Evelyn Vericel from the Laboratoire d'Haemobiologie in Lyon and Mr D. de Fornel from the Department of Biochemistry in Limoges examined the preventive effects of alpha-linolenic acid on nutritional encephalomalacia in chickens. This disease is probably caused by an imbalance between two

essential fatty acids and is exacerbated by vitamin E deficiency. Results indicated improvements in diet that may overcome the disease.

A computerized data base for food analysis was developed by Mr P. Drury, Mrs Jann White and Mrs Wendy Doyle. This allows the food intakes of zoo animals to be quantified in energetic and dietary terms. The data base includes information on 36 nutrients and the fatty acid composition for each food. It was obtained from food tables and by analysis of several hundred food samples in collaboration with the Ministry of Agriculture, Fisheries and Food.

A study of the effects of steroidal contraceptives on human milk production and composition was completed by Mr P. Drury and Miss Theresa Lenihan. The work was carried out as part of a multicentre World Health Organization study based on women from Hungary and Thailand.

Radiology

Professor G. H. du Boulay, Mrs Vicki Aitken and Mr D. Fleming, with the assistance of Miss Toni Finlay of St Bartholomew's Hospital, used new methods of ultrasound to monitor ovulation and early pregnancy. They found it possible to study these events in animals as small as marmoset monkeys. However, application of the methods to a wider range of species will require further refinement of the available techniques. Results will help accelerate the breeding of endangered species in captivity.

Investigations were carried out to determine the occurrence of nutritional bone disease in reptiles. This project, in which the Departments of Nutrition, Veterinary Science and several Keeper staff co-operate, will focus on the bone condition and tissue chemistry of Common Iguanas. It should be possible to improve the diets of captive reptiles and thereby reduce the incidence of nutritional bone disease, especially in young animals.

A joint project with the Department of Nutrition, studying Baboons maintained on high fat diets, revealed changes in the calibre and normal physiological responses of the arteries to the brain. The study is continuing in order to examine changes in diet that might prevent these effects.

In a further study with Dr D. J. Boullin and Miss Sheila Redmond, the factors affecting vasospasm after subarachnoid haemorrhage were investigated in primates. Results are shedding light on similar problems in human medicine.

Reproduction

The Department's research programmes continued in the four related areas of behaviour, endocrinology, gamete biology and developmental biology, under Dr A. F. Dixon, Dr J. K. Hodges, Dr H. D. M. Moore and Professor J. P. Hearn respectively.

REPRODUCTION IN ZOO ANIMALS

Great Apes

A service for diagnosing pregnancy was operated by Dr Dixon, with samples being analysed from nine Zoos in the United Kingdom. In an investigation of puberty and infertility in captive apes, urinary levels of testosterone were measured in multiple samples from ten male Gorillas and Orang-utans. The results show that great apes reach puberty in captivity at an earlier age than expected and that Orang-utans are less prone than Gorillas to problems of infertility.

Giant Panda

Semen collected from the Giant Panda was studied by Dr Moore and Dr W. V. Holt with a view to testing its fertilizing capacity and to establishing a bank of frozen Panda semen. Successful artificial insemination of the female Panda 'Shao Shao' in Madrid by Dr Moore and Mr J. A. Knight (Veterinary Science) resulted from these studies, with twin cubs born after a gestation of 158-160 days. One of the cubs has survived. Close collaboration with staff of the Madrid Zoo enabled regular collections of urine samples through pregnancy, which were analysed by Dr Hodges and Mrs Deborah Bevan to provide the first detailed record of hormonal levels throughout gestation in this species. The results will make possible for the first time the detection of ovulation, the diagnosis of pregnancy and the prediction of birth in the Giant Panda.

Blackbuck

Dr Holt extended the research programme of sperm freezing and artificial insemination to ungulate species, focusing on the Blackbuck. A successful artificial insemination was achieved in this species, with the hormonal events around ovulation and throughout pregnancy being established by Dr Hodges.

Equidae

Dr Hodges, Dr P. M. Summers, Mr A. Hill and staff of the Veterinary Hospital and Cotton Terraces, in collaboration with Dr W. R. Allen from the TBA Equine Fertility Unit, Cambridge, successfully recovered five embryos non-surgically from zebras. Embryos will be transferred to donkeys to test a system for increasing the production of more endangered species.

Bennett's Wallaby

A study of the reproductive biology of this species and its distribution at Whipsnade was completed by Mr D. Fleming, Mr R. Cinderey (Veterinary Science) and Professor Hearn. There is a precise breeding seasonality and differences between males and females in the use of the 400 acres available. Studies of the hormonal control of seasonal breeding and of the unique embryonic diapause found in macropoid marsupials are continuing.

PRIMATE RESEARCH

Drs Hodges and Sadie Eastman extended the facilities for plasma and urinary analysis of hormones to 12 steroids and gonadotrophins, including several that are important in ovulation and pregnancy. Comparative studies of steroid metabolites were initiated, in collaboration with Professor W. Collins from King's College Hospital and Dr J. Else and Mr D. Makawiti from the Institute of Primate Research in Nairobi, in order to improve the prediction and recognition of ovulation and pregnancy in baboons, Vervet Monkeys, marmosets and humans.

Drs Dixon and K. M. Kendrick investigated the role of oestradiol, testosterone and progesterone in controlling female behaviour in marmoset monkeys, finding that females remained highly attractive to males even after ovariectomy. The effects of carrying their young on the circulating plasma prolactin levels of male marmosets were studied by Dr Dixon and Miss Lynne George. Significant increases in circulating prolactin occurred in males that were carrying twin offspring. This was the first demonstration in a male mammal of changes in prolactin levels associated with parental behaviour.

A study of spermatogenesis and sperm maturation in the marmoset monkey and human was carried out by Drs Holt and Moore and Mr T. Hartman, and comparative studies of epididymal function were continued, including a project in which Mr E. Wango isolated androgen receptors from the epididymis. The way in which human sperm develop the capacity, as they pass down the epididymis, to fertilize ova was determined by Dr Moore in collaboration with Mr J. Pryor from the Institute of Urology. Further studies on the lipid composition and structure of the sperm surface membrane in a number of species were performed by Dr Holt and Mr R. North in order to understand the effects and improve the success of freezing semen from endangered species. In a new research project, Dr Moore, Mr Hartman and Mr D. H. Ellis produced a range of monoclonal antibodies to investigate sperm surface characteristics and to see if a vaccine against sperm might be produced. A number of epididymal secretions were identified that may affect fertility and several specific antibodies were developed that are capable of preventing fertilization. A preliminary study was carried out in collaboration with Dr C. O'Morain from the MRC Clinical Research Centre on the antifertility effects of a certain anti-inflammatory drug which may act by altering epididymal function. Drs Holt and Moore developed new image analyser and computer techniques to obtain the rapid assessment of semen samples. This work should lead to greater success in studies of infertility, freezing of sperm and artificial insemination.

Mr C. R. Harlow completed an investigation of the hormonal control of ovulation and cycle length in the marmoset monkey. With staff of the Sobell Pavilion, he also carried out a study of the cycle in female DeBrazza's and Diana Monkeys. Dr P. M. Summers studied the changes in the uterine wall during the cycle of the marmoset and is developing ways of recovering and transferring embryos non-surgically. Professor Hearn and Miss Sara Gems successfully cultured and grew marmoset embryos for up to four weeks which, together with studies of embryonic development in the mother, give a greater understanding of factors controlling early pregnancy, implantation and embryonic loss.

Curators' Research

The Curators are responsible for the management of the Society's Collections of animals at Regent's Park and Whipsnade on a scientific basis, ensuring the highest standards of care while providing an exhibition that is scientifically correct, educationally valuable and aesthetically attractive. Co-operation between the Society and other zoos in joint management and breeding of animals continued.

Two research students commenced PhD projects during the year that are being supervised by Dr B. C. R. Bertram, Curator of Mammals and Aquarium. Mr R. A. Brett is studying the ecology of Naked Mole Rats in Kenya and made considerable progress by using small radio-transmitters in finding out the complex organization and behaviour of these extraordinary animals. A colony of Naked Mole Rats was established in Regent's Park and they are settling down well. Mr D. Moltu is investigating the behaviour and ecology of urban Grey Squirrels in the Gardens and in Regent's Park. In a project funded by the Anthropoid Ape Advisory Panel, set up by major British Zoos, a scientific management and breeding plan for Great Apes in captivity in the United Kingdom is being developed. Dr Bertram visited Kenya as an investigator in a project studying Egyptian vultures.

Mr P. J. S. Olney, Curator of Birds and Reptiles, and his staff improved the already successful artificial incubation programmes for birds and reptiles. Baseline data was obtained on the humidity and temperature requirements of incubating eggs and on the techniques of hand rearing. Considerable experience was gained with the successful incubation and rearing of an Andean Condor and two Tarric Hornbills.

Mr D. Ball and staff of the Reptile House participated in several projects including the study of the nutritional value of various foods for reptiles, the histology of reptile eggs and the sexing of lizards using laparoscopic techniques. In a joint project with the Department of Biophysics at University College London, four Many Banded Kraits were established and their venom collected routinely for studies of protein neurotoxins.

At Whipsnade Park there was an increase in research activities. Mr S. Harding from the Department of Zoology, Oxford, continued his work on radiotracking the territorial behaviour of Reeves's Muntjac within the Park, while Mr C. Powles from the same department studied their territorial behaviour for his honours degree. Mr A. Taber, also from the Department of Zoology, Oxford, studied the behaviour and ecology of Mara. A number of Bennett's Wallabies were ear-tagged and many were sedated to obtain measurements of offspring and dates of birth. Miss Sheila O'Connor of the Department of Applied Biology, Cambridge, spent six months studying White Rhinoceros for her MSc degree on the behaviour of the herd at Whipsnade. In a project funded by The Royal Society, Dr Margaret Klinowska of the Department of Anatomy, Cambridge, continued her observations of the dolphins and carried out a number of 24 hour long studies of emitted sounds. Long bones were examined by Miss Barbara Noddle of University College Cardiff, who is relating bone structure to those found in archaeological digs. Material was provided for Dr Caroline Pond of the Open University to investigate the role of muscle activity in determining the size of fat cells.

Advisory and Consultant Services

The Society daily receives requests for a great range of information and assistance. A vast number of enquiries come from the general public seeking information and advice on pets, pests and wildlife; many others come from scientific and government institutions throughout the world. The following list illustrates the help offered by the Society's staff.

ANIMAL MANAGEMENT AND CONSERVATION

Food and Agriculture Organization (United Nations): Advice on animal capture techniques.

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

Ministry of Agriculture, Fisheries and Food: General advice on non-domestic animal management (disease susceptibility, handling).

Nature Conservancy Council: Handling of large mammals especially deer. Completion of a handbook on the handling of British deer.

Niger Government: Continuing assistance with the World Wildlife Fund/IUCN project to prepare plans for a National Park in the eastern Air mountains and for surveying the Termit mountain region of south-east Niger.

Overseas Development Administration: Advice on animal capture techniques.

World Wildlife Fund/International Union for the Conservation of Nature and Natural Resources: Advice on animal capture techniques.

Zoos: Advice on husbandry of New World primates.

ARCHITECTURE AND PLANNING

Algeria: Advising Atkins Sheppard Fidler Associates on the planning and design of three proposed zoo parks, including inspecting and assessing the suitability and potential of the sites at Annaba, Constantine and Oran.

Kuwait: Continuing advice to the John S. Bonnington Partnership on the proposed new National Zoo and on the proposed new Salmiya Island Dolphinarium.

Qatar: Advising the John S. Bonnington Partnership on the proposed Stage 4 of the new Doha Zoo.

United Kingdom: Continuing advice to the London Borough of Newham on the proposed City Farm and Children's Zoo.

COMPARATIVE MEDICINE AND PHYSIOLOGY

Action Research on Multiple Sclerosis: Advice and collaborative studies on dietary management in multiple sclerosis.

British Council: Advice on enzyme immunoassays. Advice on tropical disease immunodiagnosis.

British Museum (Natural History): Radiological anthropological study of skulls.

Central Public Health Laboratory (London): Studies on the epidemiology of Listeriosis.

Eastman Dental Hospital (London): Collaboration on the application of dental technology in non-domestic animals.

Equine Fertility Unit (Cambridge): Collaborative studies on embryo transfer in wild Equidae.

Equine Research Station (Newmarket): Collaboration on development of thoroughbred horse blood typing methods.

Howlett's Zoo Park (Canterbury): Collaborative research on reproduction in the elephant.

Institute of Obstetrics and Gynaecology (London): Collaborative studies on steroid metabolism in primates.

Institute of Primate Research (Kenya): Joint studies on reproductive endocrinology in primates.

Institute of Urology (London): Collaborative research on human epididymis.

King's College Hospital Medical School (London): Collaborative research on the influence of steroidal contraceptives on the composition of human milk.

Laboratory of the Government Chemist: Collaboration on the analysis of nutrients in foodstuffs.

Liverpool Veterinary Investigation Centre: Joint diagnosis of botulism in gulls in the Mersey area.

London School of Hygiene & Tropical Medicine: Collaborative projects on malaria and Chagas disease. Collaborative projects on diseases transmissible to man from primates.

Madrid Zoo (Spain): Collaborative work on the artificial insemination and pregnancy of the Giant Panda.

Medical Research Council Centre, Addenbrooke's Hospital (Cambridge): Collaborative study on the analysis of antigen variation.

Medical Research Council Clinical Research Centre (Harrow): Collaborative research on mammalian male specific antigens. Collaborative work on human infertility.

Medical Research Council Human Biochemical Genetics Unit (London): Collaborative study of human C6 variation.

Medical Research Council Reproductive Biology Unit (Edinburgh): Collaborative studies on identification of urinary steroids.

Micromasurements Ltd (Saffron Walden): Collaboration on computer programming.

Ministry of Agriculture, Fisheries and Food: Collaborative research on the role of essential fatty acids.

National Heart Hospital (London): Collaborative studies on cardiomyopathy.

National Institute for Biological Standards and Control (London): Collaborative studies on 'Wasting Marmoset Syndrome'.

National Zoological Park, Washington (USA): Collaborative work on the artificial insemination of the Giant Panda.

North West Water Authority: Joint study on *Clostridium botulinum* in the Mersey estuary.

Ortho Diagnostic Inc (USA): Collaboration on development of immunoassays.

Queen Mary's Hospital Roehampton (London): Joint studies on postnatal care of premature young mammals.

Radcliffe Infirmary (Oxford): Collaboration on detection of alpha-fetoprotein. Collaborative studies on cerebral vessels in stroke (pharmacology and history).

Royal Free Hospital Medical School (London): Collaborative research on placental biochemistry. Collaborative studies on cardiomyopathy.

San Diego Zoo Research Department (USA): Collaborative studies on the genetics of captive populations. Collaborative projects on comparative urinary oestrogen analysis.

St Bartholomew's Hospital (London): Collaboration in ultrasound studies.

University of Birmingham (Medical School): Collaborative research on antigen purification.

University of Odense (Denmark): Collaborative studies on primate early pregnancy proteins.

University of Oxford (Animal Behaviour Research Group): Joint diagnosis of botulism in gulls on Walney Island.

University of Reading (Department of Physiology & Biochemistry): Collaborative research on steroid binding globulins in primates.

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

Wellcome Research Laboratories (Beckenham): Preparation and analysis of karyotypes of *Aotus* monkeys.

World Health Organization: The Institute of Zoology is recognized as a collaborative centre for malaria reference and research, comparative medicine and pathology of non-domestic vertebrates, and the fatty acid composition of human milk. Staff visited Canada, Cuba, India, Singapore and Sweden to give lectures and practical courses in serology; and visited Kenya, Sri Lanka and the USA to give lectures and technical advice on primate reproductive physiology and the study of infertility agents from plants.

Zoos: Radioimmunoassays for monitoring hormonal status and pregnancy in primates; genetic phenotyping; haematological and radiological examinations; laparoscopic examination of monomorphic birds for sex determination.

TRAINING AND INTERNATIONAL LIAISON

Brazilian Government: Postgraduate training for one veterinary surgeon in zoo animal medicine and management.

Burmese Government: Postgraduate training for two veterinary surgeons in zoo animal medicine and management.

Hungarian Government (Budapest Zoo): Postgraduate training for one veterinary surgeon in zoo animal medicine and management.

Mexican Government (University of Vera Cruz): Postgraduate training for one veterinary surgeon in zoo animal medicine and management.

Moroccan Government: Postgraduate training for one veterinary surgeon in zoo animal medicine and management.

University of London: Training of students in microbiology, radioimmunoassay, gamete biology and behavioural studies.

World Health Organization: Training in serology for visiting workers from Australia, Brazil, Burma, Ghana, India, Iraq, Kenya, Liberia, Nigeria, Oman, Saudi Arabia, South Yemen and Sweden. Training in reproductive physiology for visiting staff from the Academia Sinica, Beijing (China) and the University of Nairobi (Kenya).

VETERINARY CONSULTANCY SERVICES

Brooke Hospital for Animals, Cairo: Advice on veterinary aspects.

Consultant Veterinary Advice: Bedford College, London; London School of Hygiene and Tropical Medicine (Microbiology Department); University College London (Anatomy Department). Veterinary practices, local authorities, the police, zoological collections and wildlife managers and research staff worldwide.

Duphar Veterinary Ltd: Preparation of technical leaflets on animal care for veterinary surgeons.

Mefit Babbie (on behalf of Commissioner for the Jonglei Area of Southern Sudan). Chairmanship of the Scientific Steering Committee advising on ecological work in the Jonglei Area. Supervision of veterinary aspects of the livestock and wildlife fieldwork associated with this project.

Municipality of Doha (Qatar): Technical services for establishment of new zoological gardens.

Collaboration with Scientific Societies, Zoological, Conservation and Research Organizations

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

Anthropoid Ape Advisory Panel (Great Britain): Dr. B. C. R. Bertram, Dr A. F. Dixon, Dr D. B. Whitehouse (Members,

Scientific Committee)

Archives Internationales de Pharmacodynamie: Dr D. J. Boullin (Editorial Board)

Association for Animal Haematology: Dr C. M. Hawkey, Mr M. G. Hart (Committee Members)

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

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

British Institute of Radiology: Professor G. H. du Boulay (Past President; Council and Appeal Co-ordinator)

British Ornithologists' Union: Mr P. J. S. Olney (Editorial Board, 'New Dictionary')

British Veterinary Association: Mr D. M. Jones (Council; Public Relations Group)

British Veterinary Zoological Society: Mr D. M. Jones (Senior Vice-President), Mr V. J. A. Manton (Council)

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

Central Middlesex Hospital: Professor M. A. Crawford (Member, Management Committee of Research Unit for Action Research on Multiple Sclerosis)

CoEnCo: Mr M. K. Boorer (Natural History Youth Subcommittee)

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

English Tourist Board: Mr C. G. C. Rawlins (Member of Committee of Enquiry into Financial Welfare of British Zoos)

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

European Association of Radiology: Professor G. H. du Boulay (British delegate to the Statutes Commission)

European Economic Community: Professor M. A. Crawford (Member, *Ad hoc* Committee on dietary fats)

Ewell Technical College: Dr C. M. Hawkey (Lecturer)

Fauna and Flora Preservation Society: Mr D. M. Jones (Hon. Secretary)

Fauna and Flora Preservation Society/World Wildlife Fund Mountain Gorilla Project: Dr A. F. Dixon (Project Co-ordinator)

George Washington University, Washington (USA): Dr D. J. Boullin (Special Lecturer in Pharmacology)

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

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

International Council for Bird Preservation: Mr P. J. S. Olney (Chairman, British Section)

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

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

International Union for the Conservation of Nature and Natural Resources (Species Survival Commission): Dr B. C. R. Bertram (Member: Cat Specialist Group), Professor J. P. Hearn (Member, Primate Specialist Group), Mr P. J. S. Olney (Zoological Society Representative), Mr C. G. C. Rawlins (Vice Chairman, Captive Breeding Specialist Group)

International Union of Directors of Zoological Gardens: Mr C. G. C. Rawlins (Member, Membership Committee)

Journal of Autism and Childhood Schizophrenia: Dr D. J. Boullin (Editorial Board)

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

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

- Journal of Endocrinology*: Dr A. F. Dixson (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 Council)
- Journal of Reproduction and Fertility*: Professor J. P. Hearn (Editorial 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 (Management and Scientific Group)
- Medical Research Council*: Professor J. P. Hearn (Member, Primate Breeding Review Group; Member, Advisory Group on *In vitro* Fertilization; Member, Simian Virus Committee; Member, Training Awards Panel)
- Medicina*: Dr A. Voller (Editorial Board)
- Ministry of Agriculture, Fisheries and Food*: Professor M. A. Crawford (Codex Alimentarius Technical Advisor on Fats and Oils)
- National Federation of Zoological Gardens of Great Britain and Ireland*: Mr V. J. A. Manton (Member, Conservation and Breeding Committee), Mr C. G. C. Rawlins (Council and Acting Secretary)
- Nature Conservancy Council*: Dr B. C. R. Bertram (Member, Scientific Authority for Animals), Professor J. P. Hearn (Member, Scientific Authority for Animals—until April), Mr C. G. C. Rawlins (UK Committee for International Nature Conservation)
- Neuroradiology*: Professor G. H. du Boulay (Chairman and Managing Editor)
- Open University*: Professor J. P. Hearn (External Examiner, Department of Biology)
- Paddington Technical College*: Dr C. M. Hawkey, Mr D. M. Jones, Mr J. A. Knight (Lecturers)
- Parliamentary and Scientific Committee*: Professor M. A. Crawford (Member)
- Primate Society of Great Britain*: Dr B. C. R. Bertram (Member, Conservation Working Group), Dr A. F. Dixson (Council; Member, Conservation Working Group; Member, Study Group on Breeding Primates for Biomedical Research), Professor J. P. Hearn (Council; Chairman, Study Group on Breeding Primates for Biomedical Research), Dr J. K. Hodges (Council)
- Radcliffe Infirmary, Oxford*: Dr D. J. Boullin (Senior Scientist, MRC Department of Clinical Pharmacology)
- 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 (Member, Council of Section of Comparative Medicine)
- Society for the Study of Fertility*: Professor J. P. Hearn (Council—until July), Dr J. K. Hodges (Council)
- Tropenmedizin und Parasitologie*: Dr A. Voller (Editorial Board)
- Universities Federation for Animal Welfare*: Dr A. F. Dixson, Professor J. P. Hearn (Members, Primate Working Party)
- University of Cambridge*: Dr A. F. Dixson (External Examiner, Department of Anatomy)
- University of London*: Professor G. H. du Boulay (Professor of Neuroradiology and Head of the Lysholm Radiological Department, National Hospital for Nervous Diseases), Dr A. F. Dixson (Course Lecturer, Psychology Department, Birkbeck College; Zoology Department, University College), Mr R. A. Fish (Subject Sub-committee in Biological Sciences), Dr C. M. Hawkey (Honorary Lecturer in Haematology, Royal Free Hospital), Professor J. P. Hearn (Member, Board of Studies in Zoology; Visiting Professor, Zoology Department, University College), Dr J. K. Hodges (Course Lecturer, Zoology Department, University College), Mr D. M. Jones (Member, Board of Studies in Zoology; Visiting Lecturer, Department of Medicine, Royal Veterinary College), Dr H. D. M. Moore (Course Lecturer, Zoology Department, University College), Dr G. R. Smith (Course Lecturer, Department of Microbiology, Royal Veterinary 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)
- University of Witwatersrand*: Dr A. F. Dixson (External Examiner, Psychology Department)
- Vaccine*: Dr A. Voller (Editorial Board)
- World Health Organization*: Professor J. P. Hearn (Member, Steering Committee of Task Force on Infertility Agents from Plants; Adviser, Reproductive Physiology and Applied Primate Research, WHO Special Programme), 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 (Consultant Scientist)
- Zoo Biology*: Professor J. P. Hearn (Editorial Board)
- Zoological Record Advisory Committee*: Dr Marcia A. Edwards (Member of the joint BIOSIS/Zoological Society Committee to advise on the production of the *Zoological Record*)

General Matters

Catering Department and Zoo Restaurants Limited

The low level of attendances again affected trading at both Zoos.

The major review of the Society's catering operations, which was carried out in 1981, resulted in the appointment of Grandmet Catering Services Limited to manage the catering at London Zoo from 1 March 1982. Most of the Society's Catering Staff were re-employed by Grandmet but there were redundancy costs of some £54,000, which increased the catering loss for the year.

Under the management of Mrs J. Newton, Grandmet Catering Services made improvements to systems and training; it is hoped that catering at London Zoo will soon become profitable again.

At Whipsnade catering continues to be run by the Society under the management of Mrs B. Heley. Operational changes have been made, and there was an improvement in the trading position during 1982.

Evening function business at London was affected by the reorganization and by the general recession. 118 functions were held compared to 112 in 1981. At Whipsnade the figures were 33 and 28 respectively. Sales campaigns aimed at increasing custom for these functions have started.

Zoo Enterprises Limited

The range of merchandise for sale in the Zoo Shops was expanded as recommended in the 1981 catering review and increased sales by 28%. Despite this, 1982 was a disappointing year. Pressure on gross margins, some re-development of the London Zoo Shop and other costs depressed the net return to the Society by 32%.

A review of goods and services was commenced with the object of improving presentation and management.

Public Relations

Coverage of the Society's activities by the media maintained its usual high level. The involvement of the Government in the Society's affairs was fully and sympathetically reported.

Many events have already been described elsewhere in this Report but of particular note was the TV documentary 'A Day at the Zoo', produced and narrated by Miss Esther Rantzen. This aroused great public interest in the baby chimpanzee 'Benjie', hand-reared by his keeper, Peter Dillingham, and the two subsequently appeared in the 'Blue Peter' TV programme. The BBC2 Classic Serial team filmed material for a dramatization of Sir Angus Wilson's satirical book 'The Old Men at The Zoo', to be shown in Autumn 1983, and many other film crews visited the Zoo to make programmes as diverse as medical training films, episodes of television series and television commercials.

Many photocalls were held during the year at both London and Whipsnade. 'Esther', the baby Black Rhino, 'Sonia', the Andean Condor and 'Dilberta', the Asian Elephant, attracted considerable press coverage as did the death of the cockatoo 'Cocky', London Zoo's oldest resident.

Travelling exhibitions relating to Whipsnade were circulated to major libraries in Bedfordshire and Buckinghamshire. A two day exhibition to promote Whipsnade as a local amenity, was again organized in Milton Keynes Shopping Centre.

Two other noteworthy events, 'Bear Day' and 'The World's Smallest Monkeys' exhibition, have already been reported.

Staff

At the end of the year there were 395 full-time members of staff as follows:

	London	Whipsnade
Animal Management	90	45
Construction, Maintenance, Gardening, General and Public Services	92	37
Catering and Retail Departments	10	11
Institute of Zoology	66	1
Other Scientific Departments including Publications, Library and Education	19	—
Administrative Departments	19	5

A list of the senior members of staff is given in Appendix 2.

GENERAL

During the year staff received pay increases in line with the general wage movements of the outside groups, mainly in the public sector, with which they are aligned. Once again, in the interests of economy, a number of posts were left vacant for varying periods of time.

When Grandmet Catering Services Limited took over the catering operation at London Zoo all but one member of staff, who was transferred to Works Department, became redundant. Happily, Grandmet were able to offer employment to 37 of the 44 staff affected. Seven of the 37 staff were also granted an early pension from the Society.

The Manpower Services Commission continued to sponsor eight work experience appointments in the Animal Departments at London Zoo and the Society was again able to offer short periods of experience in clerical work to some teenagers undertaking office and/or business studies. The Society continued to offer training to other Zoo personnel, some from overseas.

Twelve staff were successful in the written examination for the Ordinary Certificate in Zoo Animal Management; distinctions were gained by Mrs S. Adams, Messrs A. Davis-Butler, C. Cadwallader, A. Coughlan and S. Donnelly. Mr Cadwallader was awarded a Nobby Ashby Prize.

AWARDS

Mr Jack Lambden, Overseer of Mammals, who retired in January after more than 42 years' service, received the MBE in the Queen's Birthday Honours List. The Society's Bronze Medal was presented to Mr T. Law, Head Gardener, Regent's Park, for long and meritorious service.

The completion of 25 years' continuous service was recognized by the presentation of gold watches to Miss Joan Crammond, Press Officer, Dr Marcia Edwards, Assistant Director of Science (Publications and General), Mr T. B. Kichenside, Overseer of Mammals, Mr J. W. Secrett, Senior Assistant Catering Manager (Administration), Miss Brenda Tye, Administrative Assistant, Membership Department, Mr J. Weatherhead, Head Keeper,

Section 5, Whipsnade Park and Mr R. B. Willis, Overseer of Mammals.

APPOINTMENTS AND PROMOTIONS

Miss S. Churchman, *Junior Assistant Catering Manager, Whipsnade Park*

Mr V. Curzon, *Head Keeper, Section 2, Whipsnade Park*

Mr J. F. Fitzgerald, *Head Gatekeeper, Regent's Park*

— Mr W. A. James, *Head Keeper, Elephant and Rhino Pavilion, Regent's Park*

— Mr T. B. Kichenside, *Overseer of Mammals, Regent's Park*

Mr J. Nicklin, *Head Keeper, Cotton Terraces, Regent's Park*

RESIGNATIONS AND RETIREMENTS

Retirements included Mr D. Milton, Head Keeper, Elephant and Rhino Pavilion, Regent's Park, after more than 38 years, Mr Harry Stevens, Head Keeper, Whipsnade Park, after more than 27 years' service, Miss Brenda Tye, Administrative Assistant, Membership Department, after more than 25 years' service, Mr A. Roberts, Accountancy Assistant, Regent's Park, and Mrs A. Bryant, Senior Toilet Attendant, Regent's Park, after more than 20 years, Mr R. Possnett, Foreman Park Attendant, Whipsnade Park, after 18 years, Mr M. Magnier, Head Gatekeeper, Regent's Park, after more than 19 years.

Mr M. Taverner, Office Manager, Whipsnade Park, resigned to take up another appointment.

OBITUARY

We regret to record the deaths of Mr V. Nathen, Main Office Housekeeper since 1976 and formerly a member of the Architects' Department since 1961, and of the following pensioners: Mrs A. Duffield and Messrs J. Randall, E. Day and H. Peppiatt.

Acknowledgements

The Council would like to thank all the Fellows and the other people who generously give their time to serve on advisory committees. Their help and advice are of great assistance to the work of the Society.

The help given by many scientists, veterinarians, organizations and firms is also greatly appreciated. The Council would like to thank: the staff of British Airways, for their help in transporting the baby elephant 'Dilberta' from Sri Lanka; Lord Coke for providing Evergreen Oak for browsing mammals; Mr Nick Williams for supplying and advising on the use of a hydroponic grass machine; Mr V. Lunn, Head Riverkeeper, River Test, and Mr P. Brill, Lock and Weirkeeper, Cartagna Weir, for assistance in obtaining freshwater fish for the Aquarium; Mr H. Harris, of the Crown Fishery, Broxbourne, for supplying trout for the Aquarium; the Centre for Overseas Pest Research for supplying locusts; Friends of Highgate Cemetery for allowing collection of brambles for the Insect House; Mr Brown, Headkeeper of Burnham Beeches, for allowing the Insect House to collect display material there; Mr Bernard Betts of May & Baker for supplying various surplus insects; Mrs M. Ryan and her colleagues at Paddington College for their co-operation in organizing and running the Zoo Animal Management courses; Miss Caroline Betts, Miss Donna Edwards and Mr Robert Atkinson for voluntary assistance to the Curator of Mammals; Professor G. M. O. Maloiy, Mr F. W. Woodley, Mr G. Jos, Mr O. Mnyambo and Miss S. Fenn for assistance to the Curator of Mammals' research students; many volunteers, from the XYZ Club and elsewhere,

who gave help as short-term Keepers; the St John's Ambulance Brigade; Corporation of London Animal Quarantine Station for the care of animals in transit; Kew Gardens for their generous help; Dr H. A. Reid of the Liverpool School of Tropical Medicine and Mr D. Warrall of the Radcliffe Infirmary, Oxford, for advice on the treatment of snake bite; Dr P. Ballard and staff of the Middlesex Hospital for help with emergency snake bite treatment; Mr H. P. Liquorish of the Conservators of Epping Forest for providing materials for decorating reptile cages.

The Council also acknowledges with thanks assistance given to:

THE INSTITUTE OF ZOOLOGY for grants provided by the Agricultural Research Council; the Ford Foundation; the Medical Research Council; the Ministry of Agriculture, Fisheries and Food; the Natural Environmental Research Council; the Wellcome Trust; the World Health Organization; Action for Research into Multiple Sclerosis (ARMS); Ciba/Geigy; Cystic Fibrosis Trust; Dalgetty Spillers; Edinburgh E.A.R. Congress Educational Trust; Guggenheim Foundation; Horserace Betting Levy Board; Lalor Foundation; Marks and Spencer plc; North West Water Authority; Ortho Diagnostic Inc; Roche Products Ltd; Royal Free Hospital Cardiac Research Fund; and Unilever NV (Vlaanderen). Donations and other financial support have also been provided by Acran Systems Ltd; Agfa-Gevaert; Mrs Vincent Astor; Buckmaster & Moore, Isle of Man (through Mrs King and Mr Margot); Downs Surgical; DRGST (France); Dunn Nutritional Laboratories; the European Economic Community; Fisons Pharmaceuticals Ltd; Glaxo Laboratories Ltd; ICI Pharmaceuticals Ltd; INSERM (France); the International Primatological Society; IVAC Ltd; Hawke Electronics; Hoechst (UK) Ltd; Parke Davis & Co; Reckitt & Colman Ltd; the Royal Society; the Trust for Research and Education in the Biology of Reproduction; Upjohn Ltd; Mr W. L. Whitehouse, FRCS, FRCOG; Richard Wolf Ltd (West Germany); and the Wolfson Foundation. Many friends and colleagues have provided research materials and assistance to the Institute, including the staff of Bristol, Chester, Edinburgh, Howletts Park, Jersey, Madrid, Marwell, Minnesota, San Diego and Washington Zoos; Animal Health Trust Small Animals Centre, Newmarket; Animal Virus Research Institute, Pirbright; ARC Institute for Animal Physiology, Babraham; ARC Institute for Research on Animal Diseases, Compton; Birmingham Regional Virus Laboratory; Bristol Veterinary School; British Museum (Natural History); Cambridge School of Veterinary Medicine; Cambridge V.I. Centre; Cardiff Public Health Authority; Cardiothoracic Institute; Central Public Health Authority, Colindale; Central Veterinary Laboratory, Weybridge; Chelsea Hospital for Women; Commonwealth Institute of Helminthology; Corning Medical; Eastman Dental Hospital; Equine Research Station, Newmarket; Institute of Obstetrics and Gynaecology, Hammersmith Hospital; Leptospira Reference Laboratory; London School of Hygiene & Tropical Medicine; Luton & Dunstable General Hospital; Luton Public Health Laboratory; MAFF, Reading; Middlesex Hospital; MRC Group on Mechanisms in Tumour Immunity, Cambridge; MRC Human Biochemical Genetics Unit, London; MRC Radioimmunoassay Group, Edinburgh; MRC Reproductive Biology Unit, Edinburgh; National Institute for Research in Dairying, Reading; Norwich V.I. Centre; Paddington College; Royal Free Hospital Medical School (Dept. of Biochemistry); Royal Liverpool Hospital (Dept. of Medical Microbiology); Royal Veterinary College; St Bartholomew's Hospital Medical

College; St George's Hospital Public Health Authority; Sheffield University (Dept. of Medical Microbiology); Sutton Bonington V.I. Centre; Tenovus Institute, Cardiff; University of Adelaide; University College, Cardiff; University College Hospital (Dept. of Clinical Pathology); Wellcome Museum of Medical Science; Wellcome Research Laboratories, Berkhamstead; and Westminster Hospital.

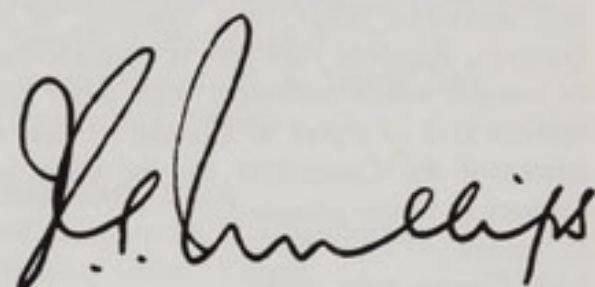
EDUCATION DEPARTMENT by Mrs N. Barnett, Mrs M. Bates, Miss F. Beattie, Mr and Mrs Bell, Mrs F. Boon, Mrs D. Boyd-Gibbins, Mrs K. Burnell, Mrs J. Burr, Mrs S. Catalove, Mrs G. Clarke, Mrs P. Clark, Mrs J. Coffey, Mrs A. Darby, Mrs B. Diamond, Mrs K. Dixon, Mrs J. Drewett, Mrs M. Fane, Mr J. Garbat, Mrs K. Hadley, Mrs P. Healy, Mrs S. Heinemann, Mrs V. Jeffery, Mrs M. Jenkins, Mrs J. Jones, Mrs M. Kieve, Mrs M. Lloyd, Mrs W. McLerie, Mrs J. McRae, Mrs V. Mills, Mr J. Minshull-Fogg, Mrs A. Montefiore, Mrs F. Myer, Mrs A. Nathan, Mrs Y. Oliver, Miss R. Parks, Mrs M. Picton-Davies, Mrs B. Richardson, Mrs M. Rook, Mrs A. Sherman, Mrs D. Smith, Mrs J. Smith, Mrs S. Stevens, Mrs S. Sussman, Mrs M. Wallis, Mrs R. Williams, Mrs H. Wohl, Miss E. Wood and Miss K. Wooderson, who conducted tours for primary school children at Regent's Park; and to Mrs M. and Miss L. Amis, Mr J. Barrington-Johnson, Miss F. Beattie, Mrs R. Billsborough, Mr J. Bradley, Mrs J. Burr, Miss J. Castle, Mrs J. Coffey, Miss J. Costello, Mrs G. Cowan, Mrs A. Darby, Mrs M. Davis, Mr S. Davis, Mrs K. Dixon, Mrs J. Drewett, Mr M. Badie, Ms J. Foote, Miss P. Garcia-Reyes, Mr D. Godfrey, Mrs S. Gordon, Mrs P. Haddleton, Mr T. Hartman, Mrs P. Healy, Mrs S. Heinemann, Mrs J. Jones, Mrs M. Kieve, Miss K. Matsuoka, Miss M. McKay, Mrs D. Mimmack, Miss A. Morohashi, Miss F. Neal, Mr J. Needham, Mr S. Peirce, Mrs A. Plunkett, Mr A. Pond, Miss J. Pracy, Mr R. Purnell, Mrs B. Richardson, Miss J. Roberts, Mrs M. Rook, Mrs M. Russell, Mrs A. and Miss H. Sherman, Mrs B. Suschitzky, Mr S. Wakeling, Mrs E. Ward, Miss M. Whitaker, Mrs R. Williams and Miss E. Wood, who took part in the programme helping visitors to the London Zoo. Thanks are also due to the Inner London Education Authority, and especially Mr Dennis Marshall of that organization, the Bedfordshire Local Education Authority, the National Gallery, Marwell Zoo, and to those members and friends of the Society who spoke at the Sixth Form Symposia.

PUBLIC RELATIONS by Mrs S. Avery, Mrs D. Belmont, Miss A. Boese, Mr R. Briers, The Ford Motor Co., Mrs Jocelyn Jones, Miss F. Kirby-Green, Mr S. Milligan, Mr E. Morecambe, Mr J. Morris, Mr J. Nettles, Mr J. Pertwee, Miss E. Rantzen, Miss V. Singleton, Mr C. Timothy, Mrs P. Usick, Mr P. Vaughan, Mrs F. Wickersham and Miss M. Wolfitt; and the representatives of the media and photographers, whose co-operation and interest in the work of the Society is gratefully acknowledged.

PURCHASING AND TRANSPORT DEPARTMENT by the Ministry of Agriculture, Fisheries and Food; HM Customs and Excise; Medical Research Council; Miss G. E. Standing and the many people who have kindly offered and sent Bamboo for the two Giant Pandas and also Evergreen Oak for other animals.

WHIPSNADE PARK by the British Red Cross Society, who help to staff the first aid post; Chiltern Radio; Dunstable Fire Brigade; The Forestry Commission; HMS Daedalus; S. G. Kitsell Ltd;

Lee Valley Water Board; Luton & Dunstable Hospital; Mr M. Marriott, MAFF; Merk, Sharp & Dohme; Mrs M. Moody, South Beds. Youth Project; The National Trust; Reckitt & Colman; Dr C. P. Royall; Mr V. Sherriff; Thames Valley Water Board; and The Wellcome Foundation.



Secretary

Committees 1982-1983

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 Council so that the advice of the Committee can be taken into account in future planning.

L. Borley

Lady Casson, RIBA, FSIA

R. d'Erlanger

Lord Donaldson, OBE

A. M. Hassell

E. Hutchison, MA(RCA), DipLA, ALI

The Hon. William McAlpine

Lady Rupert Nevill

N. Sitwell

Lady Daphne Straight

H.G. The Duke of Wellington, MVO, OBE, MC,

Chairman

Sir Gordon Wolstenholme, OBE, FRCP, FIBiol

Secretary: J. W. Toovey, AA(Dipl Hons), FRIBA

Finance Committee

Terms of Reference: To approve the annual estimates and accounts before presentation to Council; to examine the financial aspects of major projects; to receive reports on investments; and to advise Council on financial policy.

E. M. Behrens

Lord Buxton, MC, DL, *Chairman*

Lord Donaldson, OBE

D. L. Donne

The Hon. William McAlpine

C. J. Perrin

C. E. Gordon Smith, CB, MD, FRCP, FRCPath

The Hon. Sir Ronald Waterhouse, JP, MA, LLB

Sir Richard Way, KCB, CBE

H.G. The Duke of Wellington, MVO, OBE, MC

Secretary: A. M. Jones, FCIS, FAAL, FBIM

The Institute of Zoology Committee

Terms of Reference: To advise Council on all matters relating to the Institute of Zoology.

Professor B. A. Cross, CBE, ScD, FRS

Professor B. K. Follett, PhD, DSc

Professor R. L. Gardner, PhD, FRS

J. S. Garrow, MD, PhD, FRCP

Professor I. M. Glynn, PhD, MD, FRS

Sir William Henderson, DSc, FRCVS, FIBiol, FRS,

FRSE, *Chairman*

Professor G. E. Lamming, MS, PhD, FIBiol

Professor N. A. Mitchison, DPhil, FRS

Professor J. A. F. Rook, DSc, FIBiol, FRSE, FRSC

Professor A. J. Zuckerman, MD, DSc

Secretary: Professor J. P. Hearn, MSc, PhD, FIBiol

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, Veterinary Officers and Pathologist.

Miss Mary Brancker, OBE, FRCVS

Miss Marie E. Coates, PhD

M. J. Coe, BSc, PhD

G. Corney, MB, ChB, MD, DCH, DRCOG

S. A. Keeble, BVSc, MRCVS

I. Keymer, PhD, FRCVS, MRCPath, FIBiol

N. King, BVSc, MRCVS

Miss Gwyneth Lewis, BSc

Professor D. E. Noakes, BVetMed, PhD, MRCVS

A. J. Stevens, MA, BVSc, MRCVS, DipBact, *Chairman*

T. A. P. Walker

Secretary: D. M. Jones, BSc, BVetMed, MRCVS, FIBiol

Education Committee

Terms of Reference: To advise Council on all matters relating to the Society's educational activities.

E. D. Barlow, MA, MB, BChir, FRCPsych

Mrs J. W. Bonnard, HMI

Professor W. S. Bullough, DSc, *Chairman*

W. Chapman, TD, DipEdAd, MISM, MBIM

S. F. Everiss, MBE, MA, MSc, FIBiol

P. H. Greenwood, DSc, FLS

O. R. Impey, MA, DPhil

Mrs Judy King

D. Marshall, BSc, FIBiol

Professor T. G. Onions, BSc, PhD, FIBiol

Professor K. Simkiss, PhD, DSc, FIBiol

J. Sparks, BSc, PhD

D. J. Stanbury, BSc, ARCS

Secretary: M. K. Boorer, BSc, DipEd

Publications Committee

Terms of Reference: To advise Council on matters concerning the publication of zoological research; to serve as an editorial board for the *Journal of Zoology* and *Transactions* of the Society; to make recommendations on Library policy.

Professor E. H. Ashton, PhD, DSc, *Chairman*

Professor A. d'A. Bellairs, DSc, MRCS, FLS

Professor R. J. Berry, MA, PhD, DSc, FRSE, FIBiol, PLS

Professor A. J. E. Cave, MD, DSc, FRCS, FLS

Professor J. L. Cloudsley-Thompson, MA, PhD, DSc

Professor B. K. Follett, PhD, DSc

P. H. Greenwood, DSc, FLS

J. P. Harding, PhD, FLS

Professor J. D. Pye, BSc, PhD, FLS

H. N. Southern, MA, DSc

V. R. Southgate, PhD

Secretary: Marcia A. Edwards, PhD, FLS

Zoological Record Editorial Board

Terms of Reference: To advise on the scope, content and format of the *Zoological Record*.

J. Clevedon Brown, PhD, FLS

R. Cross, MA

R. W. Crosskey, DSc

Professor J. Green, DSc, PhD

J. P. Harding, PhD, FLS

C. M. Hutt, FLS

A. K. Kent, PhD

D. Macfarlane, BSc

R. A. Neal, DSc, PhD

J. G. Sheals, PhD, FIBiol

E. I. White, CBE, DSc, FRS

C. A. Wright, DSc, PhD, FIBiol, *Chairman*

Secretary: Marcia A. Edwards, PhD, FLS

Zoological Record Advisory Committee

Terms of Reference: To advise the Society and Biological Abstracts Inc. as to the manner in which each is performing its responsibilities under the Agreement between them; to consider and make recommendations with respect to the activities and future development of the *Zoological Record*.

Professor E. J. W. Barrington, MA, DSc, FRS

R. W. Crosskey, DSc

Professor D. E. Davis, PhD

Professor R. E. Gordon, PhD, *Chairman*

H. E. Kennedy, PhD

R. Trumbull, PhD

C. A. Wright, DSc, PhD, FIBiol

Secretary: Marcia A. Edwards, PhD, FLS

International Zoo Yearbook Editorial Board

Terms of Reference: To advise on the content and production of the *Yearbook*.

M. R. Brambell, VetMB, MA, PhD, MRCVS

The Countess of Cranbrook

S. F. Everiss, MBE, MA, MSc, FIBiol

Miss Janet Kear, PhD, *Chairman*

Professor Dr H. G. Klos

R. D. Martin, DPhil, FIBiol

Miss Jane Thornback

Ir. D. Van Dam

Secretary: P. J. S. Olney, BSc, DipEd, FLS, 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.

Professor J. M. Dodd, DSc, FIBiol, FRS, FRSE, *Chairman*

Professor B. K. Follett, PhD, DSc

Miss Vera Fretter, DSc

Miss Barbara M. Gilchrist, PhD

H. N. Southern, MA, DSc

Professor J. E. Webb, DSc, PhD

C. A. Wright, DSc, PhD, FIBiol

Secretary: Marcia A. Edwards, PhD, FLS

Promotion Committee

Terms of Reference: To advise Council on measures relating to the promotion of the Society's aims and activities in order to ensure the long-term stability of the Society.

E. M. Behrens

Lord Buxton, MC, DL, *Chairman*

Lord Donaldson, OBE

The Hon. Ivor Montagu

C. J. Perrin

Sir Richard Way, KCB, CBE

W. L. Whitehouse, RD, MB, FRCS, FRCOG, FIBiol

Secretary: J. P. Griffin, BSc

Staff

Directors:

- Zoos:** C. G. C. Rawlins, OBE, DFC
Science: Prof. J. P. Hearn, MSc, PhD, FIBiol
Assistant Director of Science (Publications and General): Marcia A. Edwards, PhD, FLS*
Assistant Director of Zoos: D. M. Jones, BSc, BVetMed, MRCVS*
Architect: J. W. Toovey, AADipl(Hons), FRIBA
Deputy Architect: J. C. Wears, DipArch(Dunelm)
Commercial Manager: J. P. Griffin, BSc
Curator of Birds/Reptiles: P. J. S. Olney, BSc, DipEd, FLS*
Curator of Mammals/Aquarium/Insects: B. C. R. Bertram, MA, PhD, FIBiol*
Honorary Research Associate: Professor A. J. E. Cave, MD, DSc, FRCS, FLS*
Curator, Whipsnade Park: V. J. A. Manton, MRCVS*
Education Department:
Education Officer: M. K. Boorer, BSc, DipEd
Assistant Education Officers: W. J. Griffiths, BSc, FETC; R. E. Dazely, BSc, CertEd; Gillian E. Standring, MA, CertEd
Establishment Officer: M. E. McInerney
Finance Officer: A. M. Jones, FCS, FAAI, FBIM
Librarian: R. A. Fish, FLA
Press Officer: Miss J. Crammond
Retail Manager (London and Whipsnade): J. F. Brown

Institute of Zoology (including the Nuffield Laboratories of Comparative Medicine, the Wellcome Laboratories of Comparative Physiology, the Animal Hospital and the Curators' Research Units).

- Director:** Professor J. P. Hearn, MSc, PhD, FIBiol
Administrative Assistant: Constance Nutkins
Laboratory Superintendent (Nuffield): P. R. E. Wallace, FIST
Laboratory Superintendent (Wellcome & Hospital): G. F. Nevill, HNC
Visiting Research Fellow: Professor J. Grandage, BVetMed, MRCVS, DVR (Murdoch University, Australia)

GENETICS:

- Acting Head:** D. B. Whitehouse, PhD
Hon. Research Associate: Sir Cyril A. Clarke, KBE, MD, FRCP, FRS
Research Assistant: Wendy Putt

INFECTIOUS DISEASES:

- Head:** G. R. Smith, PhD, MRCVS, DVSM, DipBact
Immunology Unit:
Head: A. Voller, PhD, DSc (Hon. Research Associate)
Research Assistants: D. E. Bidwell, PhD; M. S. Grundy, PhD

NUTRITION:

- Head:** Professor M. A. Crawford, PhD
Research Fellows: Wendy Doyle, DipDietetics; W. R. Hare, PhD; D. C. Kuhn, AB, MS (USA)—until September
Visiting Research Graduates: S. C. Cunnane, PhD (Canada)—until July; D. de Fornel, BSc (France); Evelyn Vericel, PhD (France)

RADIOLOGY:

- Head:** Professor G. H. du Boulay, MB, BS, FRCP, DMRD, FRCR

Hon. Research Associate: D. J. Boullin, MSc, PhD, MA

Radiographer: Victoria Aitken, DSR

REPRODUCTION:

Head: Professor J. P. Hearn, MSc, PhD, FIBiol
Behaviour Unit:

- Head:** A. F. Dixon, PhD
Hon. Research Associate: T. B. Poole, PhD
Research Assistant: K. M. Kendrick, PhD
Postgraduate Research Student: D. Harris, BSc
Developmental Biology Unit:
Head: Professor J. P. Hearn, MSc, PhD, FIBiol
Research Assistants: D. Fleming, MIBiol; P. M. Summers, BVSc, MSc, PhD
Postgraduate Research Student: C. R. Harlow, BSc

Endocrinology Unit:

- Head:** J. K. Hodges, MSc, PhD
Research Assistant: Sally-Ann K. Eastman, PhD

Gamete Biology Unit:

- Head:** H. D. M. Moore, PhD
Research Assistants: D. H. Ellis, BSc; W. V. Holt, PhD
Postgraduate Research Student: Linda Baggott, BSc
Visiting Research Student: E. O. Wango, BVSc (Kenya) (until October)

VETERINARY SCIENCE:

- Senior Veterinary Officer:** D. M. Jones, BSc, BVetMed, MRCVS
Veterinary Officer (London): J. A. Knight, BVetMed, MRCVS
Veterinary Officer (Whipsnade): Vacant
Visiting Veterinary Officer: J. Samour Hasbun, DVM, MVZ (Mexico) (until November)
Hon. Research Associate: Professor A. N. Worden, FRCPath
Hospital Superintendent: A. K. Fitzgerald, RANA
Haematology Unit:
Head: Christine M. Hawkey, PhD
Postgraduate Research Student: P. C. R. Pearce, MIBiol, MPhil
CURATORS' RESEARCH UNITS:
Postgraduate Research Students: R. A. Brett, BSc; D. Moltu, BSc (Norway)

Publications:

- International Zoo Yearbook:**
Editor: P. J. S. Olney, BSc, DipEd, FIBiol, FLS*
Assistant Editors: Pat Ellis, Benedicte Sommerfelt, BSc
Journal of Zoology, Symposia, Transactions of the Zoological Society of London, Nomenclator Zoologicus:
Editor: Marcia A. Edwards, PhD, FLS*
Editorial Assistant: L. G. Ellis
Administrative Assistant: Unity M. M. McDonnell, MA

London Zoo

- Gardens Executive:** J. McCorry
Head Gardener: T. Law
Maintenance Manager: L. G. Taverner
Overseer of Birds: R. Barrow
Overseers of Mammals: R. B. Willis, T. B. Kichenside
Overseer of Reptiles: D. Ball, AIAT
Purchasing and Transport Foreman: N. Thornton

HEAD KEEPERS:

- Aquarium:** R. Dumbleton

- Aquatic Birds and Birds of Prey:** D. N. Wood
Bears: S. Morton
Bird House: W. G. R. Daines
Children's Zoo: P. Anscombe
Elephant and Rhino Pavilion: D. Milton; W. A. James (from June)
Insects: R. P. Humphrys, AIAT
Lion Terraces: E. F. Swain
Monkeys: G. Callard
Parrot House and Eastern Aviary: R. J. Watkins
Pheasantry and Ostrich House: D. R. Ellis
Reptiles: S. B. Savage
Small Mammals: R. R. Smith, FIAT
Ungulates: J. Nicklin

Whipsnade Park

- Park Manager:** O. C. Chamberlain
Veterinary Officer: Vacant
Office Manager: M. L. Taverner (until November)
Catering Manager: Bridgid Heley
Head Gardener: J. Folds
Senior Overseer: G. Stanbridge
Overseer: J. Datlen

HEAD KEEPERS:

- Central Ungulate Section:** H. Stevens (until March), V. Curzon (from May)
Southern Ungulate Section: A. W. Billington
Northern Ungulate Section: P. J. Williams
Carnivore Section: F. Hughes
Elephant Section: J. Weatherhead
Bird Section: A. White
Children's Zoo: P. C. Milne

Consulting Staff

- Consulting Architect:** Sir Hugh Casson, KCVO, PRA, RDI, RIBA
Consulting Landscape Architect: Professor Sir Peter F. Shephard, CBE, BArch, PPRIBA, MRTPI, PPILA
Honorary Herpetologist: Professor A. d'A. Bellairs, DSc, MRCS, FLS
Honorary Veterinary Consultant: W. H. G. Rees, BSc, DVSM, MRCVS
Medical Referee: J. P. Horder, CBE, FRCP, PRCGP, FRCPSych

*Also members of the Institute of Zoology

Publications by Society's Staff and Research Workers

- ADU, D., GLYNN-WILLIAMS, D., QUAKYI, I. A., VOLLER, A., ANIM-ADDO, Y., BRUCE-TAGOE, A. A., JOHNSON, C. D. & HOLBOROW, E. J. (1982). Anti-ssDNA and anti-nuclear antibodies in human malaria. *Clin. exp. Immunol.* 49: 310-316.
- BERTRAM, B. C. R. (1982). Leopard ecology as studied by radiotracking. *Symp. zool. Soc. Lond.* No. 49: 341-352.
- BERTRAM, B. C. R. & BURGER, A. E. (1980). Aspects of incubation in ostriches. *Ostrich* 52: 36-43.
- BONNEY, R. C. & KINGSLEY, S. (1982). Endocrinology of pregnancy in the orang-utan (*Pongo pygmaeus*) and its evolutionary significance. *Int. J. Primatol.* 3: 431-444.
- BONNEY, R. C., WOOD, D. J. & KLEIMAN, D. G. (1981). Endocrine correlates of behavioural oestrus in the female Giant panda (*Ailuropoda melanoleuca*) and associated hormonal changes in the male. *J. Reprod. Fert.* 64: 209-215.
- COPPOLA, R., LOMBARDI, R., HAWKEY, C. M., ZUGGERI, Z. M. & MANNUCCI, P. M. (1980). Varied immunological reactivity of factor VIII from animal plasma. *Thromb. Res.* 15: 473-480.
- CRAWFORD, M. A. (1982). Essential fatty acids and brain development. In *Biological aspects of schizophrenia and addiction*: 157-161. Hemmings, G. (Ed.). Chichester: John Wiley & Sons Ltd.
- CRAWFORD, M. A. & STEVENS, P. A. (1981). A study on essential fatty acids and multiple sclerosis. *Prog. Lipid Res.* 20: 255-258.
- CRAWFORD, M. A. & STEVENS, P. A. (1981). Essential fatty acids, diet and heart diseases. In *Current Topics in Nutrition Diseases 5. New trends in nutrition, lipid research and cardiovascular diseases*: 217-228. Bazan, N. G., Paolette, R. & Iacono, J. (Eds). New York: Alan R. Liss Inc.
- DIXON, A. F. (1982). The owl monkey (*Aotus trivirgatus*). In *Reproduction in New World primates*: 69-114. Hearn, J. P. (Ed.). Lancaster: MIP Press Ltd.
- DIXON, A. F. & GEORGE, L. (1982). Prolactin and parental behaviour in a male New World primate. *Nature, Lond.* 229: 551-553.
- DOYLE, W. & CRAWFORD, M. A. (1982). Maternal nutrition in pregnancy: The special role of dietary fats and socio-economic interaction. *Nutr. & Health* 1: 209-212.
- DOYLE, W., CRAWFORD, M. A. & LAURANCE, B. M. (1982). Dietary survey during pregnancy in a low socio-economic group. *Proc. Nutr. Soc.* 41: 44A.
- DOYLE, W., CRAWFORD, M. A., LAURANCE, B. M. & DRURY, P. (1982). Dietary survey during pregnancy in a low socio-economic group. *J. Human Nutr.* 36A: 95-106.
- DREWETT, R. F., KENDRICK, K. M., SANDERS, D. J. & DREW, A. M. (1982). A quantitative analysis of the feeding behaviour of suckling rabbits. *Devl Psychobiol.* 15: 25-32.
- FRACKOWIAK, R. S. J., POZZILLI, C., LEGG, N. J., DU BOULAY, G. H., MARSHALL, J., LENZI, G. & JONES, T. (1981). Regional cerebral oxygen supply and utilization in dementia. A clinical and physiological study with oxygen-15 and positron tomography. *Brain* 104: 753-778.
- FRAPE, D. L., TUCK, M. G., SUTCLIFFE, N. H. & JONES, D. M. (1982). The use of inert markers in the measurement of the digestibility of cubed concentrates and of hay given in several proportions to the pony, horse and white rhinoceros (*Diceros simus*). *Comp. Biochem. Physiol.* 72A(1): 77-83.
- GERSHON, A. A., FREY, H. M., STEINBERG, S. P., SEEMAN, M. D., BIDWELL, D. E. & VOLLER, A. (1981). Determination of immunity to varicella using an Enzyme Linked Immunosorbent Assay. *Arch. Virol.* 70: 169-172.
- GRUNDY, M. S. (1982). Antigen fractions from *E. histolytica* trophozoites, strain HK9, for use in ELISA. *Arch. invest. Med.* 13 (Suppl. 3): 249-254.
- GRUNDY, M. S. (1982). Preliminary observations using a multi-layer ELISA method for the detection of *E. histolytica* trophozoite antigens in stool samples. *Trans. R. Soc. Trop. Med. Hyg.* 76: 396-400.
- HARDING, R. D., HULME, M. J., LUNN, S. F., HENDERSON, C. & AITKEN, R. J. (1982). Plasma progesterone levels throughout the ovarian cycle of the common marmoset (*Callithrix jacchus*). *J. med. Primatol.* 11: 43-51.
- HARE, W. R. (1982). ω -Oxidation of fatty acids in the sheep. PhD Thesis, University of Aberdeen.
- HARRIS, P., HEATH, D., SMITH, P., WILLIAMS, D. R., RAMIREZ, A., KRUGER, H. & JONES, D. M. (1982). Pulmonary circulation of the llama at high and low altitudes. *Thorax* 37: 38-45.
- HAWKEY, C. M., ASHTON, D. G., HART, M. G., CINDERLEY, R. N. & JONES, D. M. (1982). Haematological findings in red-necked wallabies (*Protemnodon rufogrisea*) with necrobacillosis. *Res. vet. Sci.* 33: 290-294.
- HAWKEY, C. M., HART, M. G. & JONES, D. M. (1982). Clinical hematology of the common marmoset (*Callithrix jacchus*). *Am. J. Primatol.* 3: 179-199.
- HEARN, J. P. (1982). Immunology of contraception. *Immunol. Today* 2: 250.
- HEARN, J. P. (1982). The Giant panda. *New Scientist* 93: 509.
- HEARN, J. P. (1982). Marsupials of Australia. *Wildlife* 24: 110.
- HEARN, J. P. (1982). A vaccine against pregnancy. *Spectrum* 180(1): 4-6.
- HEARN, J. P. (Ed.) (1982). *Reproduction in New World primates*. Lancaster: MTP Press Ltd.
- HEARN, J. P. (1982). The marmoset monkey (*Callithrix jacchus*). In *Reproduction in New World primates*: 181-125. Hearn, J. P. (Ed.). Lancaster: MTP Press Ltd.
- HOLT, W. V. (1981). Fusion of avian erythrocytes and ram spermatozoa induced by glycerol mono-oleate. *J. Cell Biol.* 91: 170a.
- HOLT, W. V. (1982). Epididymal origin of a coiled-tail sperm defect in a boar. *J. Reprod. Fert.* 64: 485-489.
- HOLT, W. V. (1982). Functional development of the mammalian sperm plasma membrane. In *Oxford reviews of reproductive biology* 4: 193-237. Finn, C. A. (Ed.). Oxford: Oxford University Press.
- JONES, D. M. (1981). Veterinary care of non-domestic animals. *Int. Zoo Newsl.* 28(4): 12-21.
- JONES, D. M. (1982). Management of mammals in captivity. In *East African mammals. An atlas of evolution in Africa, IIID (Appendix II)*: 608-632. Kingdon, J. (Ed.). London & New York: Academic Press Inc.
- JONES, D. M. (1982). Conservation in relation to animal disease in Africa and Asia. *Symp. zool. Soc. Lond.* No. 50: 271-285.
- JONES, D. M. (1982). The veterinary surgeon and wildlife conservation. *Vet. Rec.* 111: 427-431.
- JONES, D. M. (1982). The veterinary surgeon in the zoo world. *Vet. Rec.* 111: 526-528.
- JONES, D. M. (1982). The nutrition of parrots and parakeets including budgerigars (From Proc. BVZS Parrot Society, 1979). *Budgerigar World* 2: 10-12.
- JONES, D. M. (1982). Veterinary aspects of the maintenance of orang-utans in captivity. In *The orang-utan. Its biology and conservation*: 171-199. de Boer, L. E. M. (Ed.). The Hague: Dr W. Junk.
- JONES, D. M. & STAFF OF THE DEPARTMENT OF VETERINARY SCIENCE (1982). *The management of exotic animals. 1-8: Primates; Chinchillas; Mynah birds; Parrots and macaws; Tortoises; Terrapins; Gerbils; Pythons and boas.* (Information Guides). Southampton: Duphar Veterinary Ltd.
- KENDRICK, K. M. (1981). Effect of testosterone and the oestrous cycle on neuronal refractory periods and firing rates of stria terminalis neurones in the female rat. *Expl Brain Res.* 44: 331-336.
- KENDRICK, K. M. (1982). Inputs to testosterone-sensitive stria terminalis neurones in the rat brain and the effects of castration. *J. Physiol.* 323: 437-447.
- KENDRICK, K. M. (1982). Effect of castration on medical preoptic/anterior hypothalamic neurone responses to stimulation of the fimbria in the rat. *J. Physiol.* 323: 449-461.
- KENDRICK, K. M. (1982). The effect of castration on stria terminalis neurone absolute refractory periods using different antidromic stimulation loci. *Brain Res.* 248: 174-176.

- KESSLER, H., TSQUAYE, K. N., SMITH, A., JONES, D. M. & ZUCKERMAN, A. J. (1982). Hepatitis A and B at the London Zoo. *J. Infection* 4: 63-67.
- KEYMER, I. F., JONES, D. M., PUGSLEY, S. L. & WADSWORTH, P. F. (1982). A survey of tuberculosis in birds in the Regent's Park Gardens of the Zoological Society of London. *Avian Path.* 11: 563-569.
- KINGSLEY, S. R. (1982). Causes of non-breeding and the development of the secondary sexual characteristics in the male orang-utan: a hormonal study. In *The orang-utan. Its biology and conservation*: 215-229. de Boer, L. E. M. (Ed.). The Hague: Dr W. Junk.
- KNIGHT, J., BROSTOFF, J., PACK, S. & SARNER, M. (1982). A possible allergic illness in a Giant panda. *Lancet* 1982 (2): 1450-1451.
- LASLEY, B. L., MONTFORT, S. L., HODGES, J. K. & CZEKALA, N. M. (1981). Comparison of urinary oestrogens during pregnancy in diverse primate species. In *Fetal endocrinology (ORPRC Symposium on primate reproductive biology)* 1: 111-126. Novy, M. J. & Resko, J. A. (Eds). New York: Academic Press Inc.
- MANTON, V. J. A. (1982). Conservation. 1981 *World Register of Pere David's Deer*.
- MONJARDINO, J., FOWLER, M. J. F., MONTANO, L., WELLER, I., TSQUAYE, K. N., ZUCKERMAN, A. J., JONES, D. M. & THOMAS, H. C. (1982). Analysis of hepatitis virus DNA in the liver and serum of HBe antigen positive chimpanzee carriers. *J. Med. Virol.* 9: 189-199.
- MONTALI, R. J., MANN, P. C., JONES, D. M., GRINER, L. A., KUEN, G. R., NARUSHIMA, E. & BUSH, M. (1982). Leiomyomas in the genital tract of large zoo animals. *Proc. Int. Symp. Zoo Anim. Dis.* 24: 117-122.
- NILSSON, L. A. & VOLLER, A. (1982). A comparison of thin layer immunoassay (TIA) and enzyme linked immunosorbent assay (ELISA) for the detection of antibodies to *T. cruzi*. *Trans. R. Soc. trop. Med. Hyg.* 76: 95-97.
- OLNEY, P. J. S. (1982). Zoos. In *Encyclopaedia Britannica: 1982 Book of the Year*. Chicago: Encyclopaedia Britannica Inc.
- PRAKASH, A. & MOORE, H. D. M. (1982). Localization of Δ^5 - 3β and 17β hydroxysteroid dehydrogenase activity in the efferent ducts, epididymis and vas deferens of the rabbit, hamster and marmoset monkey. *J. Reprod. Fert.* 66: 95-100.
- PUTT, W., FISHER, R. A., DAWAA, N., ZEVEGMID, D., STUBBE, M. & SCHNITZER, A. (1979). An investigation of some 36 genetically determined enzyme and protein markers in Przewalski and domestic horses. In *Genetics and hereditary diseases of the Przewalski horses*: 21-32. de Boer, L. E. M. & Bouman, I. (Eds). Rotterdam: Foundation for the Preservation and Protection of the Przewalski Horse.
- RODBLAT, F., HAWKEY, C. M., O'BRIEN, D. P. & TUDDENHAM, E. G. D. (1982). Immunologic studies of factor VIII coagulant activity (VIII : C). 2. Factor VIII in selected vertebrates. *Thromb. Res.* 25: 423-431.
- SARGEANT, P. J., WILLIAMS, J. E. & JONES, D. M. (1982). Electrophoretic isoenzyme patterns of *Entamoeba histolytica* and *Entamoeba chattoni* in a primate survey. *J. Protozool.* 29: 136-139.
- SCHOFIELD, S. P. M. & DIXSON, A. F. (1982). Comparative anatomy of monoaminergic neurons in the brains of New World and Old World monkeys. *Am. J. Primatol.* 2: 3-19.
- SCHOFIELD, S. P. M. & DIXSON, A. F. (1982). Distribution of catecholamine and indoleamine containing neurons in the brain of the Common marmoset (*Callithrix jacchus*). *J. Anat., Lond.* 134: 315-338.
- SMITH, G. R. (1982). Animal disease and animal conservation. *Nature, Lond.* 295: 16.
- SMITH, G. R. (1982). Botulism in waterfowl. *Symp. zool. Soc. Lond.* No. 50: 91-119.
- SUMMERS, P. M. (1982). *Studies on mixed-species Bos indicus-Bos taurus chimaeric cattle*. PhD Thesis, Australian National University, Canberra.
- THULBORN, K., DU BOULAY, G. H., BUCHEN, L. W. & RADDA, G. A. (1982). ^{31}P NMR magnetic resonance (NMR). *In vivo* study of cerebral ischaemia in the gerbil. *J. Cerebral Blood Flow & Metab.* 2: 299-306.
- THULBORN, K., DU BOULAY, G. H. & RADDA, G. (1981). *In vivo*, non-invasive measurement of energy metabolism and pH by ^{31}P NMR in experimental stroke: Correlation with cerebral oedema. *J. Cerebral Blood Flow & Metab.* 1 (Suppl. 1): S80-81.
- TOOVEY, J. (1982). Aspects of animal housing at the London and Whipsnade Zoos in recent years. In *Zoo Design* 3: 19-23. (Proc. int. Symp. Zoo Design Construct. 3). Mitchelmore, A. P. G. (Ed.). Torquay: Paignton Zool. Bot. Gardens Ltd.
- TOOVEY, J. (1982). Hot country zoos. In *Zoo Design* 3: 123-127. (Proc. int. Symp. Zoo Design Construct. 3). Mitchelmore, A. P. G. (Ed.). Torquay: Paignton Zool. Bot. Gardens Ltd.
- VOLLER, A. & BIDWELL, D. E. (1982). Immunological diagnosis of infectious diseases with special reference to viral and parasitic diseases. In *AMNECC Advances in clinical chemistry* 1: 223-229. Khayat, M. H., Montalbetti, M., Ceriotti, G. & Bonini, P. A. (Eds). Milan: Dolphin Publishers.
- VOLLER, A. & BIDWELL, D. E. (1982). The enzyme linked immunosorbent assay. *Med. Lab. World* 1982 March: 15-19.
- VOLLER, A. & BIDWELL, D. E. (1982). Immunodiagnosis of parasitic disease. In *Parasites—their world and ours*: 381-386. Mettrick, D. F. & Desser, S. S. (Eds). Amsterdam: Elsevier Biomedical Press.
- VOLLER, A., BIDWELL, D. E. & BARTLETT, A. (1982). ELISA techniques in virology. In *New developments in practical virology*: 59-79. Howard, C. R. (Ed.). New York: Alan R. Liss Inc.
- VOLLER, A. & BONINI, S. (1982). ELISA—Methodologia e principali applicazioni. In *Immunologica clinica ed allergologia*: 595-613. Serafini, U. (Ed.). Florence: Usus Edizioni Scientifiche.
- VOLLER, A. & DE SAVIGNY, D. (1981). Diagnostic serology of tropical parasitic diseases. *J. Immunol. Meth.* 46: 1-29.
- VOLLER, A. & DRAPER, C. C. (1982). Immunodiagnosis and sero-epidemiology of malaria. *Br. Med. Bull.* 38: 173-177.
- WADSWORTH, P. F., JONES, D. M. & PUGSLEY, S. L. (1982). Primary hepatic neoplasia in some captive wild mammals. *J. Zoo Anim. Med.* 13: 29-32.
- WAHLE, K. W. J. & HARE, W. R. (1982). The effect of dietary methyl branched-chain fatty acids on aspects of hepatic lipid metabolism in the rat. *Br. J. Nutr.* 47: 61-67.
- WHITEHOUSE, D. B. (1982). Genetic variation of the sixth component of complement (C6) in the Manx shearwater (*Puffinus p. puffinus*). *Anim. blood grps biochem. Genet.* 13: 177-187.
- WILLIAMS, G. (1981). Dietary deficiencies of captive dolphins. *Prog. Lipid Res.* 20: 259-260.
- WILLIS, A. L., HASSAM, A. G., CRAWFORD, M. A., STEVENS, P. & DENTON, J. P. (1981). Relationships between prostaglandins, prostacyclin and EFA precursors in rabbits maintained on EFA-deficient diets. *Prog. Lipid Res.* 20: 161-167.
- ZUMLA, A. & VOLLER, A. (1982). A serological study on hepatoma in Zambia. *Trans. R. Soc. trop. Med. Hyg.* 76: 546-551.

Animals in the Collections

column 1	Number of animals in the Collection at 1st January 1982.
column 2	Number of animals received in 1982 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 1982.
column 4	Number of animals which died in 1982 within 30 days of birth or hatching. The figures in brackets indicate animals born or hatched during December 1981 and which died during January 1982. Stillbirths are not included.
column 5	Number of animals which died from natural causes during 1982 apart from those included in Column 4.
column 6	Number of animals disposed of in 1982 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 1982, 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

REGENT'S PARK

		1	2	3	4	5	6	7
Mammals								
MONOTREMATA								
<i>Tachyglossus aculeatus</i>	Australian Echidna	1	—	—	—	—	—	1/0
<i>Zaglossus bruijnii</i>	Bruijn's Echidna	3	—	—	—	—	—	1/2
MARSUPIALIA								
<i>Petaurus breviceps</i>	Sugar Glider	23	—	5	—	1	4	15/7/1
<i>Dactylopsila trivirgata</i>	Striped Possum	1	—	—	—	—	—	0/1
<i>Trichosurus vulpecula</i>	Brush-tailed Possum	3	—	—	—	—	1	1/1
<i>Dasyuroides byrnei</i> S	Byrne's Pouched Mouse	—	4	—	—	—	—	1/3
<i>Sarcophilus harrisi</i>	Tasmanian Devil	2	2	—	—	1	—	2/1
<i>Vombatus ursinus</i>	Common Wombat	2	2	—	—	1	1	1/1
<i>Potorous tridactylus</i>	Long-nosed Potoroo	8	1	1	—	—	3	3/4
<i>Macropus parma</i>	White-throated Wallaby	3	—	—	—	—	—	1/2
<i>Macropus rufogriseus</i>	Red-necked Wallaby	1	3	—	—	—	—	4/0
<i>Macropus fuliginosus</i>	Western Grey Kangaroo	3	—	1	—	3	—	0/1
<i>Dendrolagus goodfellowi</i>	Goodfellow's Kangaroo	1	—	—	—	—	—	0/1
INSECTIVORA								
<i>Echinops telfairi</i>	Pygmy Hedgehog Tenrec	2	—	—	—	—	—	1/1
<i>Erinaceus europaeus</i>	European Hedgehog	—	2	—	—	1	—	0/1
<i>Crocidura russula</i>	White-Toothed Shrew	—	8	8	—	—	—	4/4/8
		1	2	3	4	5	6	7



Orang-utan 'Jago', born at Regent's Park in March 1982. 'Jago' is the first Orang-utan in Britain, and one of only a very few in the world, whose parents are both captive-born.



Gaur with her calf, the first to be successfully reared in Britain



'Dilberta', the baby Asian Elephant presented to the Society by Colombo Zoo, with Mr R. D. Wimalasena, the mahout who accompanied her from Sri Lanka.



The Black Rhinoceros calf 'Esther'.

Knysna Dwarf Chameleon, bred for the first time in Britain.





The President with the sculptor Mr William Timym and his bronze sculpture of the Gorilla 'Guy', unveiled in November 1982.

Tarctic Hornbills, four weeks old. This pair were the first hornbills in the world to be artificially incubated and reared.



Welcome
to the
World's Smallest Monkeys
A Special Exhibition
about
Marmosets & Tamarins

Here in the Clore Pavilion for Small Mammals you can see one of the largest collections of Marmosets and Tamarins on view in Great Britain. They are found only in the tropical rain forests of South America.



Our Marmoset collection shows how a modern zoo cares for, studies and helps to conserve this group of animals which are related to man but in danger because of his activities.

As you walk round the Pavilion you will find more information about these 'mini-monkeys' on each of their cages. We hope you enjoy your visit to the Clore Pavilion and to London Zoo.



The 'World's Smallest Monkeys' exhibition, opened in July 1982, was an important experiment in providing information about both the animals and the conservation and research work of the Society.



One of the three Wattled Cranes hatched at Whipsnade—the first bred in Britain—with its surrogate mother, a Bantam Hen.

Head Keeper Derek Wood displays the three month-old Andean Condor—the first condor to be successfully reared in Britain.



		1	2	3	4	5	6	7
MACROSCELIDEA								
<i>Elephantulus rufescens</i>	Rufous Elephant Shrew	2	—	—	—	1	—	1/0
CHIROPTERA								
<i>Pteropus giganteus</i>	Indian Fruit Bat	27	—	7	—	6	9	5/10/4
SCANDENTIA								
<i>Tupaia belangeri</i>	Common Tree Shrew	7	2	4	1	3	—	3/5/1
<i>Lyonogale tana</i>	Large Tree Shrew	11	—	1	—	4	2	2/4
PRIMATES								
<i>Lemur catta</i>	Ring-tailed Lemur	6	—	—	—	—	1	2/3
<i>Lemur variegatus</i>	Ruffed Lemur	8	—	2	—	1	—	4/2/3
<i>Lemur fulvus</i>	Brown Lemur	6	—	1	1	—	2	2/2
<i>Lemur mongoz</i>	Mongoose Lemur	2	—	—	—	—	—	1/1
<i>Cheirogaleus medius</i>	Fat-tailed Dwarf Lemur	3	—	—	—	1	—	1/1
<i>Microcebus murinus</i>	Grey Mouse Lemur	6	—	1	1	—	1	3/2
<i>Loris tardigradus</i>	Slender Loris	2	—	—	—	—	—	2/0
<i>Nycticebus coucang</i>	Slow Loris	8	—	2	1	2	—	3/4
<i>Galago crassicaudatus</i>	Thick-tailed Bushbaby	2	—	—	—	1	—	1/0
<i>Galago senegalensis</i>	Senegal Bushbaby	2	2	—	—	1	—	1/2
<i>Aotus trivirgatus</i>	Douroucouli	9	—	1	—	—	3	2/5
<i>Pithecia pithecia</i>	White-faced Saki Monkey	8	—	2	—	—	1	7/2
<i>Cebus apella</i>	Brown Capuchin	6	—	1	—	—	—	3/3/1
<i>Saimiri sciureus</i>	Squirrel Monkey (olive-capped form)	9	—	4	2	—	1	2/8
<i>Callithrix jacchus</i>	Common Marmoset	19	1(1)	13	5	1	8	4/7/8
<i>Callithrix argentata</i>	Silvery Marmoset	6	—	2	1	—	—	3/3/1
<i>Cebuella pygmaea</i>	Pygmy Marmoset	—	2	—	—	—	—	1/1
<i>Saguinus oedipus</i>	Cotton-headed Tamarin	7	—	2	2	—	—	3/4
<i>Saguinus illigeri</i>	Red-mantled Tamarin	12	—	6	3	2	1	5/4/3
<i>Leontopithecus rosalia</i>	Golden Lion Tamarin	4	—	2	—	—	—	2/2/2
<i>Callimico goeldii</i>	Goeldi's Marmoset	4	—	4	2	1	—	2/2/1
<i>Macaca nemestrina</i>	Pig-tailed Macaque	19	2	3	2	—	4	7/11
<i>Cercocebus atys</i>	Sooty Mangabey	5	4	1	—	—	—	2/7/1
<i>Mandrillus sphinx</i>	Mandrill	6	—	—	—	—	1	1/4
<i>Theropithecus gelada</i>	Gelada Baboon	3	—	—	—	—	2	0/1
<i>Cercopithecus pygerythrus</i>	Vervet Monkey	10	1	2	—	—	1	6/6
<i>Cercopithecus diana</i>	Diana Monkey	3	1	—	—	—	2	1/1
<i>Cercopithecus neglectus</i>	De Brazza's Monkey	2	—	—	—	—	—	1/1
<i>Cercopithecus talapoin</i>	Talapoin Monkey	2	—	—	—	—	—	1/1
<i>Colobus polykomos</i>	Western Black & White Colobus Monkey	3	—	—	—	—	—	1/2
<i>Hylobates lar</i>	Lar Gibbon	5	—	—	—	1	—	1/3
<i>Pongo pygmaeus</i>	Orang Utan	9	1	1	—	—	—	5/6
<i>Pan troglodytes</i>	Chimpanzee	6	1	1	—	1	—	2/5
<i>Gorilla gorilla</i>	Gorilla	2	—	—	—	—	—	1/1
EDENTATA								
<i>Myrmecophaga tridactyla</i>	Giant Anteater	2	—	—	—	—	—	1/1
<i>Choloepus didactylus</i>	Two-toed Sloth	1	—	—	—	—	—	0/1
<i>Chaetophractus villosus</i>	Hairy Armadillo	2	4	—	—	1	1	2/2
RODENTIA								
<i>Sciurus vulgaris</i>	Red Squirrel	—	3	—	—	—	1	1/1
<i>Ratufa bicolor</i>	Malayan Giant Squirrel	2	1	—	—	1	—	1/1
<i>Funisciurus pyrrhopus</i>	Fire-footed Squirrel	3	—	—	—	1	—	1/1
<i>Callosciurus finlaysoni</i>	Finlayson's Squirrel	1	—	—	—	—	—	1/0
<i>Callosciurus prevosti</i>	Prevost's Squirrel	1	—	—	—	1	—	—
<i>Marmota monax</i>	Woodchuck	3	—	—	—	—	—	1/2
<i>Cynomys ludovicianus</i>	Prairie Marmot	3	—	—	—	3	—	—
<i>Tamias sibiricus</i>	Siberian Chipmunk	4	2	—	—	2	—	1/2/1
<i>Petaurista alborufus</i>	Red & White Flying Squirrel	1	—	—	—	—	—	1/0
<i>Glaucomys sabrinus</i>	Northern Flying Squirrel	1	—	—	—	—	—	0/1
<i>Castor canadensis</i>	Beaver	4	—	5	—	—	—	1/1/7
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
<i>Pedetes capensis</i>	Springhaas	2	—	—	—	—	—	1/1
<i>Peromyscus maniculatus</i>	White-footed Mouse	—	6	6	—	—	—	6/6
<i>Sigmodon hispidus</i>	Cotton Rat	—	6	16	—	4	—	9/9
<i>Phodopus sungorus</i>	Dwarf Hamster	53	2	>156	?	37	117	0/0/57
<i>Cricetulus barabensis</i>	Chinese Hamster	18	—	19	—	13	2	0/0/22
<i>Mesocricetus auratus</i>	Golden Hamster	7	—	4	—	8	—	0/0/3
<i>Clethrionomys glareolus</i>	Bank Vole	10	—	31	—	14	5	0/13/9
<i>Arvicola terrestris</i>	Water Vole	13	—	6	—	16	1	0/0/2
<i>Meriones unguiculatus</i>	Clawed Jird	29	—	36	—	4	42	0/0/19
<i>Meriones libycus</i>	Libyan Jird	5	2	—	—	2	—	0/0/5
<i>Micromys minutus</i>	Harvest Mouse	2	6	—	—	5	—	0/0/3
<i>Lemniscomys striatus</i>	Striped Grass Mouse	—	6	—	—	1	—	2/3
<i>Apodemus sylvaticus</i>	Field Mouse	27	—	36	—	9	18	14/22
<i>Grammomys dolichurus</i>	Long-tailed Thicket Rat	4	2	—	—	4	—	0/0/2
<i>Arvicanthis niloticus</i>	Nile Rat	>70	—	>90	—	?	80	>0/0/80
<i>Mastomys natalensis</i>	Multimammate Mouse	13	14	43	—	31	13	0/0/26
<i>Acomys cahirinus</i>	Arabian Spiny Mouse	32	—	59	—	20	19	19/33
<i>Phloeomys cumingi</i>	Philippine Cloud Rat	5	—	—	—	2	—	2/1
<i>Glis glis</i>	Fat Dormouse	11	3	—	—	2	3	3/3/3
<i>Hystrix cristata</i>	Crested Porcupine	1	—	—	—	—	—	1/0
<i>Hystrix indica</i>	Indian Porcupine	1	—	—	—	—	—	0/1
<i>Hystrix indica</i> × <i>H. cristata</i>	Hybrid Indian × Crested Porcupine	3	—	—	—	—	—	1/2
<i>Atherurus africanus</i>	African Brush-tailed Porcupine	3	—	2	1	—	—	1/2/1
<i>Coendou prehensilis</i>	Brazilian Tree Porcupine	1	—	—	—	—	—	0/1
<i>Kerodon rupestris</i>	Rock Cavy	5	—	7	2	3	—	2/2/3
<i>Dolichotis patagonum</i>	Mara	6	—	3	3	1	1	1/3
<i>Hydrochoerus hydrochaeris</i>	Capybara	2	4	—	—	2	3	1/0
<i>Cuniculus paca</i>	Spotted Paca	2	—	—	—	—	—	1/1
<i>Dasyprocta aguti</i>	Orange-rumped Agouti	2	—	—	—	—	—	1/1
<i>Myoprocta pratti</i>	Green Acouchi	—	6	—	—	1	—	3/2
<i>Chinchilla laniger</i>	Chinchilla	5	—	10	2	4	—	4/3/2
<i>Geocapromys brownii</i>	Jamaican Hutia	4	—	5	2	1	—	4/1/1
<i>Myocastor coypu</i>	Coypu	4	—	—	—	3	—	1/0
<i>Octodon degus</i>	Degu	6	—	6	1	3	—	4/4
<i>Proechimys guairae</i>	Casiragua	14	—	12	—	3	4	9/10
<i>Heterocephalus glaber</i>	Naked Mole Rat	—	93	—	—	48	—	26/19

CARNIVORA

<i>Canis lupus</i>	Grey Wolf	2	4(4)	—	—	1	—	3/2
<i>Canis latrans</i>	Coyote	2	—	—	—	1	—	1/0
<i>Fennecus zerda</i>	Fennec Fox	2	2	—	—	—	1	1/2
<i>Urocyon cinereoargenteus</i>	American Grey Fox	2	—	4	—	—	—	1/1/4
<i>Lycan pictus</i>	Cape Hunting Dog	2	—	—	—	1	—	0/1
<i>Selenarctos thibetanus</i>	Asiatic Black Bear	2	—	—	—	—	—	0/2
<i>Ursus arctos</i>	Brown Bear	4	—	—	—	—	—	2/2
<i>Ursus americanus</i>	American Black Bear	2	—	—	—	—	—	1/1
<i>Thalarctos maritimus</i>	Polar Bear	2	—	—	—	—	—	1/1
<i>Melursus ursinus</i>	Sloth Bear	2	—	—	—	1	—	1/0
<i>Ailuropoda melanoleuca</i>	Giant Panda	2	—	—	—	—	—	1/1
<i>Ailurus fulgens</i>	Red Panda	—	2	3	3	—	—	1/1
<i>Nasua nasua</i>	Ring-tailed Coati	3	—	1	1	—	—	1/2
<i>Potos flavus</i>	Kinkajou	4	—	—	—	—	—	2/2
<i>Mustela nivalis</i>	Weasel	2	—	—	—	—	—	0/2
<i>Arctonyx collaris</i>	Hog Badger	2	—	1	1	—	—	1/1
<i>Amblonyx cinerea</i>	Oriental Small-clawed Otter	3	—	4	1	—	—	2/4
<i>Genetta tigrina</i>	Blotched Genet	1	1	—	—	—	—	1/1
<i>Arctogalidia trivirgata</i>	Small-toothed Palm Civet	2	1	—	—	—	—	1/2
<i>Paguma larvata</i>	Masked Palm Civet	1	—	—	—	—	—	1/0
<i>Suricata suricatta</i>	Suricate Meerkat	1	5(2)	—	—	1	1	2/2
<i>Cynictis penicillata</i>	Yellow Mongoose	3	—	—	—	—	—	1/2
<i>Felis caracal</i>	Caracal Lynx	2	—	2	—	—	—	2/2
<i>Felis serval</i>	Serval	2	—	—	—	1	—	1/0
<i>Felis wiedi</i>	Margay	4	—	1	—	—	—	2/3
<i>Felis concolor</i>	Puma	3	—	—	—	1	1	0/1
<i>Panthera leo</i>	Lion	5	—	4	4	1	—	2/2

1 2 3 4 5 6 7

		1	2	3	4	5	6	7
<i>Panthera tigris</i>	Tiger (Sumatran form)	5	1	—	—	1	—	1/4
<i>Panthera pardus</i>	Leopard	3	—	5	3	—	—	2/3
<i>Panthera onca</i>	Jaguar	3	—	—	—	—	—	1/2
<i>Acinonyx jubatus</i>	Cheetah	4	1	—	—	—	2(2)	1/2
PINNIPEDIA								
<i>Zalophus californianus</i>	Californian Sealion	3	1	1	—	1	—	1/3
<i>Halichoerus grypus</i>	Grey Seal	2	—	—	—	1	—	0/1
TUBULIDENTATA								
<i>Orycteropus afer</i>	Aardvark	3	—	1	1	—	—	1/2
PROBOSCIDEA								
<i>Loxodonta africana</i>	African Elephant	1	—	—	—	—	—	0/1
<i>Elephas maximus</i>	Indian Elephant	—	1	—	—	—	—	0/1
HYRACOIDEA								
<i>Procavia capensis</i>	Rock Hyrax	5	—	—	—	1	—	1/3
PERISSODACTYLA								
<i>Equus przewalskii</i>	Przewalski's Horse	2	4(3)	1	—	1	1	2/3
<i>Asinus hemionus</i>	Onager (Turkmen form)	4	—	—	—	—	—	2/2
<i>Hippotigris burchelli</i>	Common Zebra	8	1	—	—	1	5	1/2
<i>Hippotigris zebra</i>	Hartmann's Mountain Zebra	—	3	—	—	—	—	1/2
<i>Tapirus terrestris</i>	Brazilian Tapir	—	2	—	—	—	—	1/1
<i>Ceratotherium simum</i>	White Rhinoceros	2	—	—	—	—	—	1/1
<i>Diceros bicornis</i>	Black Rhinoceros	2	—	1	—	—	—	1/2
ARTIODACTYLA								
<i>Sus scrofa</i>	Wild Boar	6	—	11	4	—	4(4)	5/4
<i>Phacochoerus aethiopicus</i>	Wart Hog	2	—	—	—	—	2(2)	—
<i>Tayassu tajacu</i>	Collared Peccary	2	—	—	—	—	—	1/1
<i>Choeropsis liberiensis</i>	Pygmy Hippopotamus	2	—	1	1	—	—	1/1
<i>Lama glama</i>	Llama	4	—	—	—	—	—	4/0
<i>Lama guanicoe</i>	Guanaco	2	—	—	—	—	—	0/2
<i>Lama pacos</i>	Alpaca	—	1	—	—	—	—	1/0
<i>Vicugna vicugna</i>	Vicuna	—	2	—	—	—	—	1/1
<i>Camelus bactrianus</i>	Bactrian Camel	5	1(1)	—	—	—	1	1/4
<i>Muntiacus muntjak</i>	Indian Muntjac	1	—	—	—	—	—	0/1
<i>Muntiacus reevesi</i>	Reeves's Muntjac	6	—	1	—	2	—	2/3
<i>Cervus timorensis</i>	Timor Deer	7	—	—	—	—	—	3/4
<i>Pudu pudu</i>	Pudu	4	—	1	—	—	—	3/2
<i>Rangifer tarandus</i>	Reindeer	1	3(2)	—	—	—	1	1/2
<i>Okapia johnstoni</i>	Okapi	2	1	—	—	—	—	2/1
<i>Giraffa camelopardalis</i>	Giraffe	5	—	1	1	1	1	1/2
<i>Tragelaphus strepsiceros</i>	Greater Kudu	8	1	1	—	2	2	2/4
<i>Anoa depressicornis</i>	Anoa	1	—	—	—	1	—	—
<i>Bos gaurus</i>	Gaur	5	—	1	—	—	—	3/3
<i>Syncerus caffer</i>	African Buffalo	2	—	—	—	—	2(2)	—
<i>Bison bison</i>	American Bison	4	—	1	1	1	1	1/1
<i>Kobus ellipsiprymnus</i>	Common Waterbuck	2	—	—	—	—	2(1)	—
<i>Hippotragus equinus</i>	Roan Antelope	2	4	2	—	1	1	1/5
<i>Oryx gazella</i>	Gemsbok	3	—	—	—	—	3(3)	—
<i>Oryx tao</i>	Scimitar-horned Oryx	6	—	3	1	1	—	1/6
<i>Addax nasomaculatus</i>	Addax	2	2	—	—	1	1	1/1
<i>Antelope cervicapra</i>	Blackbuck	27	3(3)	11	3	4	9	7/18
<i>Capra falconeri</i>	Markhor	7	—	3	2	2	—	4/2
<i>Ammotragus lervia</i>	Barbary Sheep	22	—	15	8	1	3	10/15
<i>Ovis musimon</i>	Mouflon	20	1	15	7	4	2	11/12
<i>Ovis canadensis</i>	Bighorn Sheep	5	—	1	—	—	—	2/4
		1	2	3	4	5	6	7

DOMESTIC

	1	2	3	4	5	6	7
Pigs: Gloucester Old Spot	2	—	—	—	—	—	1/1
Miniature	11	—	14	2	—	13	5/5
Cattle: Friesian	4	—	2	—	1	—	0/5
Jersey	1	—	—	—	—	—	0/1
Goat: Common	6	—	6	—	—	6	0/6
Golden Guernsey	5	—	3	—	—	5	1/2
Nubian	1	—	—	—	—	—	0/1
Sheep: Dorset Down	9	—	6	—	—	5	1/9
Soay	3	—	—	—	—	3	—
Black Welsh Mountain	—	1	—	—	—	—	1/0
Rabbit	12	5	67	—	2	52	0/0/30
Guineapig	30	3	42	2	23	17	10/23
Donkey	2	—	—	—	—	—	1/1
Pony: Cream	4	—	1	—	—	1	1/3
Shetland	2	—	—	—	—	1	0/1

Total-Mammals	1058	256(16)	868	78	344	507(14)	1253
---------------	------	---------	-----	----	-----	---------	------

Birds

STRUTHIONIFORMES

<i>Struthio camelus</i>	Ostrich	3	—	—	—	1	—	1/1
-------------------------	---------	---	---	---	---	---	---	-----

CASUARIIFORMES

<i>Casuarius bennetti</i>	Bennett's Cassowary	1	—	—	—	—	—	0/1
<i>Casuarius unappendiculatus</i>	One-wattled Cassowary	1	—	—	—	—	—	1/0
<i>Dromaius novaehollandiae</i>	Emu	2	—	—	—	—	—	1/1

APTERYGIFORMES

<i>Apteryx australis mantelli</i>	North Island Brown Kiwi	2	—	—	—	—	—	1/1
-----------------------------------	-------------------------	---	---	---	---	---	---	-----

TINAMIFORMES

<i>Nothoprocta perdicaria</i>	Chilean Tinamou	—	4	—	—	—	—	0/0/4
-------------------------------	-----------------	---	---	---	---	---	---	-------

SPHENISCIFORMES

<i>Eudyptes cristatus</i>	Rockhopper Penguin	4	1	—	—	1	—	3/1
<i>Spheniscus demersus</i>	Black-footed Penguin	14	2	4	1	2	—	9/6/2
<i>Spheniscus humboldti</i>	Humboldt's Penguin	5	—	—	—	—	2	2/1

PELECANIFORMES

<i>Pelecanus onocrotalus</i>	Eastern White Pelican	6	—	—	—	—	—	3/3
<i>Pelecanus crispus</i>	Crested Pelican	1	—	—	—	—	—	1/0
<i>Pelecanus erythrorhynchos</i>	American White Pelican	—	1	—	—	—	—	0/0/1
<i>Pelecanus occidentalis</i>	Brown Pelican	7	—	—	—	—	—	0/1/6
<i>Morus bassanus</i>	Gannet	2	—	—	—	—	—	0/0/2
<i>Phalacrocorax carbo</i>	Cormorant	5	—	—	—	—	—	2/1/2
<i>Phalacrocorax aristotelis</i>	Shag	3	—	—	—	—	—	3/0
<i>Phalacrocorax albiventer</i>	King Cormorant	—	1	—	—	1	—	—

CICONIIFORMES

<i>Nycticorax nycticorax</i>	Night Heron	8	—	—	—	3	—	1/1/3
<i>Cochlearius cochlearius</i>	Boatbill	1	—	—	—	1	—	—
<i>Ardeola ibis</i>	Cattle Egret	9	—	—	—	—	—	2/4/3
<i>Butoroides striatus</i>	Striated Heron	1	—	—	—	—	—	0/0/1

	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

		1	2	3	4	5	6	7
<i>Ardea cinerea</i>	Grey Heron	6	—	—	—	—	—	0/0/6
<i>Ciconia abdimii</i>	Abdim's Stork	13	—	1	—	—	—	4/4/6
<i>Ciconia maguari</i>	Maguari Stork	—	4	—	—	—	—	1/3
<i>Ciconia ciconia</i>	White Stork	3	—	—	—	2	—	0/1/0
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	2	—	—	—	—	—	1/1
<i>Threskiornis aethiopicus</i>	Sacred Ibis	30	—	19	16	1	—	4/3/25
<i>Carphibis spinicollis</i>	Straw-necked Ibis	3	—	—	—	—	—	1/1/1
<i>Eudocimus albus</i>	White Ibis	5	7	—	—	1	—	2/2/7
<i>Eudocimus ruber</i>	Scarlet Ibis	5	—	—	—	1	—	2/1/1
<i>Platalea leucorodia</i>	Spoonbill	1	—	—	—	—	—	0/0/1
<i>Phoenicopterus ruber roseus</i>	Greater Flamingo	10	—	—	—	—	—	0/0/10
<i>Phoenicopterus ruber ruber</i>	Rosy Flamingo	8	—	—	—	1	—	0/0/7
<i>Phoenicopterus chilensis</i>	Chilean Flamingo	34	—	4	1	—	2	10/7/18
<i>Phoeniconaias minor</i>	Lesser Flamingo	15	—	—	—	1	—	0/0/14

ANSERIFORMES

<i>Dendrocygna bicolor</i>	Fulvous Whistling Duck	3	—	1	—	—	1	2/1
<i>Dendrocygna arborea</i>	Cuban Tree Duck	3	—	—	—	—	—	1/2
<i>Dendrocygna autumnalis</i>	Red-billed Whistling Duck	5	—	—	—	—	—	4/1
<i>Anser caerulescens atlanticus</i>	Greater Snow Goose	3	—	—	—	—	—	1/2
<i>Anser canagicus</i>	Emperor Goose	2	—	—	—	—	—	1/1
<i>Branta sandvicensis</i>	Hawaiian Goose	6	—	—	—	1	2	2/1
<i>Branta leucopsis</i>	Barnacle Goose	7	—	15	—	2	8	4/2/6
<i>Branta bernicla orientalis</i>	Brent Goose	9	—	—	—	—	—	6/3
<i>Branta ruficollis</i>	Red-breasted Goose	2	—	—	—	—	—	1/1
<i>Cereopsis novaehollandiae</i>	Cape Barren Goose	2	—	5	2	2	—	1/1/1
<i>Tadorna tadorna</i>	Shelduck	2	—	—	—	1	—	1/0
<i>Aix sponsa</i>	Carolina Duck	6	—	—	—	1	—	4/1
<i>Aix galericulata</i>	Mandarin Duck	5	—	—	—	—	2	2/1
<i>Callonetta leucophrys</i>	Ringed Teal	6	—	7	—	2	—	5/6
<i>Chenonetta jubata</i>	Maned Goose	2	—	—	—	—	—	1/1
<i>Anas penelope</i>	Wigeon	12	—	—	—	—	—	7/5
<i>Anas sibilatrix</i>	Chiloe Wigeon	18	—	—	—	1	—	10/5/2
<i>Anas strepera</i>	Gadwall	3	—	—	—	—	—	1/2
<i>Anas crecca</i>	Teal	5	—	—	—	—	—	3/2
<i>Anas platyrhynchos laysanensis</i>	Laysan Duck	2	—	—	—	—	—	1/1
<i>Anas acuta</i>	Pintail	7	—	—	—	—	—	5/2
<i>Anas bahamensis</i>	Bahama Pintail	2	—	1	—	—	—	1/1/1
<i>Anas querquedula</i>	Garganey	2	—	—	—	—	—	1/1
<i>Anas clypeata</i>	Shoveler	11	—	—	—	—	—	5/6
<i>Marmaronetta angustirostris</i>	Marbled Teal	6	—	3	—	—	2	4/3
<i>Netta rufina</i>	Red-crested Pochard	2	—	—	—	—	—	1/1
<i>Aythya ferina</i>	European Pochard	4	—	—	—	—	—	2/2
<i>Aythya fuligula</i>	Tufted Duck	14	3	—	—	—	7	4/3/3
<i>Somateria mollissima</i>	Eider Duck	8	—	4	2	—	—	7/3
<i>Bucephala clangula</i>	Goldeneye	2	—	—	—	—	—	1/1
<i>Mergus cucullatus</i>	Hooded Merganser	1	—	—	—	1	—	—
<i>Mergus merganser</i>	Goosander	2	—	—	—	—	—	1/1
<i>Oxyura jamaicensis</i>	North American Ruddy Duck	5	—	—	—	1	—	3/1

FALCONIFORMES

<i>Vultur gryphus</i>	Andean Condor	2	—	1	—	—	—	1/2
<i>Milvus migrans migrans</i>	Black Kite	1	—	—	—	—	—	0/0/1
<i>Milvus migrans parasitus</i>	African Black Kite	1	—	—	—	—	—	0/1
<i>Haliastur indus</i>	Brahminy Kite	1	—	—	—	—	—	0/1
<i>Haliastur indus intermedius</i>	Javan Brahminy Kite	1	—	—	—	—	—	1/0
<i>Haliaeetus vocifer</i>	Fish Eagle	2	—	—	—	—	—	1/1
<i>Neophron percnopterus percnopterus</i>	Egyptian Vulture	2	—	—	—	—	—	1/1
<i>Gyps rueppellii</i>	Ruppell's Griffon Vulture	1	—	—	—	—	1(1)	—
<i>Gyps fulvus</i>	Griffon Vulture	2	—	—	—	—	—	0/0/2
<i>Torgos tracheliotus</i>	Lappet-faced Vulture	1	—	—	—	—	—	0/0/1
<i>Circaetus gallicus gallicus</i>	Short-toed Eagle	1	—	—	—	—	—	0/1
<i>Terathopius ecaudatus</i>	Bateleur Eagle	2	—	—	—	—	—	1/1
<i>Spilornis cheela ricketti</i>	Chinese Serpent Eagle	2	—	—	—	—	—	1/1
<i>Polyboroides typus</i>	Harrier Hawk	2	—	—	—	—	—	1/1

1 2 3 4 5 6 7

		1	2	3	4	5	6	7
<i>Butastur rufipennis</i>	Grasshopper Buzzard	1	—	—	—	—	—	0/1
<i>Heterospizias meridionalis</i>	Savannah Hawk	1	—	—	—	—	—	0/0/1
<i>Geranoaetus melanoleucus</i>	Grey Eagle-buzzard	1	—	—	—	—	—	1/0
<i>Buteo buteo</i>	Buzzard	2	—	—	—	—	—	1/1
<i>Buteo rufinus</i>	Long-legged Buzzard	2	—	—	—	—	—	1/1
<i>Aquila rapax</i>	Tawny Eagle	2	—	—	—	—	—	1/1
<i>Aquila rapax orientalis</i>	Western Steppe Eagle	1	—	—	—	—	—	1/0
<i>Aquila heliaca</i>	Imperial Eagle	1	—	—	—	—	—	0/1
<i>Aquila wahlbergi</i>	Wahlberg's Eagle	1	—	—	—	—	—	0/0/1
<i>Aquila chrysaetos</i>	Golden Eagle	1	—	—	—	—	—	1/0
<i>Polyborus plancus plancus</i>	Common Caracara	2	—	—	—	—	—	2/0
<i>Polyborus plancus cheriway</i>	Cheriway Carrion Hawk	2	—	—	—	—	1	0/0/1
<i>Falco tinnunculus</i>	Kestrel	2	—	—	—	1	1	—
<i>Falco cenchroides</i>	Nankeen Kestrel	1	—	—	—	—	—	1/0
<i>Falco chicquera chicquera</i>	Red-headed Merlin	1	—	—	—	1	—	—
GALLIFORMES								
<i>Crax alector</i>	Black Curassow	2	—	—	—	—	—	1/1
<i>Callipepla squamata</i>	Scaled Quail	4	—	—	—	—	2	1/1
<i>Lophortyx californica</i>	Californian Quail	2	—	1	—	1	—	1/1
<i>Lophortyx gambellii</i>	Gambel's Quail	5	—	8	3	1	7(3)	1/1
<i>Colinus virginianus</i>	Bobwhite Quail	2	—	—	—	—	—	1/1
<i>Alectoris rufa</i>	Red-legged Partridge	1	1	1	—	—	1	1/1
<i>Coturnix coturnix japonica</i>	Japanese Quail	1	—	—	—	1	—	—
<i>Coturnix delegorguei</i>	Harlequin Quail	2	—	—	—	1	—	1/0
<i>Excalfactoria chinensis</i>	Chinese Painted Quail	2	—	—	—	—	—	1/1
<i>Rollulus roulroul</i>	Crested Wood Partridge	2	—	1	—	—	—	1/1/1
<i>Tragopan satyra</i>	Satyr Tragopan	—	2	—	—	—	—	1/1
<i>Pucrasia macrolopha</i>	Koklass Pheasant	—	3	1	—	1	1	1/1
<i>Lophophorus impeyanus</i>	Impeyan Pheasant	2	2	1	—	2	2	0/1
<i>Gallus sonneratii</i>	Sonnerat's Jungle Fowl	5	—	3	—	1	4(4)	1/2
<i>Lophura leucomelana leucomelana</i>	Nepal Kalij Pheasant	2	—	—	—	—	—	1/1
<i>Lophura nycthemera</i>	Silver Pheasant	2	2	2	—	3	—	1/1/1
<i>Lophura imperialis</i>	Imperial Pheasant	5	—	—	—	—	—	2/3
<i>Lophura swinhoii</i>	Swinhoe's Pheasant	2	—	—	—	—	—	1/1
<i>Lophura diardi</i>	Siamese Fire-back Pheasant	2	—	—	—	—	—	1/1
<i>Crossoptilon crossoptilon</i>	White Eared Pheasant	2	—	—	—	—	—	1/1
<i>Crossoptilon mantchuricum</i>	Brown Eared Pheasant	2	—	—	—	—	—	1/1
<i>Crossoptilon auritum</i>	Blue Eared Pheasant	2	—	1	—	—	—	1/2
<i>Catreus wallichi</i>	Cheer Pheasant	3	—	1	—	—	2	1/1
<i>Syrmaticus ellioti</i>	Elliot's Pheasant	2	—	—	—	—	—	1/1
<i>Syrmaticus humiae</i>	Hume's Bar-tailed Pheasant	2	—	—	—	—	—	1/1
<i>Syrmaticus mikado</i>	Mikado Pheasant	4	—	11	1	4	6	2/2
<i>Syrmaticus soemmerringi scintillans</i>	Scintillating Copper Pheasant	1	3	—	—	1	1	1/1
<i>Syrmaticus reevesi</i>	Reeves's Pheasant	2	—	1	—	—	1	1/1
<i>Phasianus colchicus</i>	Common Pheasant	2	—	—	—	—	—	1/1
<i>Chrysolophus pictus</i>	Golden Pheasant	3	—	1	—	—	—	2/2
<i>Polyplectron bicalcaratum</i>	Grey Peacock Pheasant	1	1	—	—	—	—	1/1
<i>Pavo cristatus</i>	Common Peafowl	2	—	4	—	—	—	1/1/4
<i>Numida meleagris</i>	Helmeted Guinea fowl	4	—	—	—	1	—	2/1
<i>Acryllium vulturinum</i>	Vulturine Guinea fowl	4	—	—	—	—	—	0/0/4
GRUIFORMES								
<i>Grus grus</i>	Common Crane	—	1(1)	—	—	1	—	—
<i>Grus antigone</i>	Sarus Crane	1	1	2	2	—	—	1/1
<i>Grus rubicunda</i>	Brolga	1	—	—	—	—	—	0/0/1
<i>Anthropoides virgo</i>	Demoiselle Crane	3	4(4)	—	—	2	—	2/2/1
<i>Anthropoides paradisea</i>	Stanley Crane	2	1(1)	—	—	—	1(1)	1/1
<i>Balearica pavonina</i>	West African Crowned Crane	2	1(1)	—	—	1	—	1/1
<i>Balearica regulorum</i>	South African Crowned Crane	2	1(1)	—	—	—	1(1)	1/1
<i>Rallus philippensis</i>	Banded Rail	1	—	—	—	1	—	—
<i>Aramides axillaris</i>	Venezuelan Wood Rail	1	—	—	—	1	—	—
<i>Aramides cajanea</i> × <i>A. axillaris</i>	Hybrid Cayenne Wood Rail × Venezuelan Wood Rail	1	—	—	—	—	—	0/1
<i>Porphyryula alleni</i>	Allen's Gallinule	1	—	—	—	—	—	0/0/1
<i>Porphyrio porphyrio poliocephalus</i>	Grey-Headed Gallinule	3	—	4	—	—	4	1/1/1
<i>Lissotis melanogaster melanogaster</i>	Black-bellied Bustard	1	—	—	—	—	—	0/1
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
CHARADRIIFORMES								
<i>Haematopus ostralegus</i>	Oystercatcher	6	—	—	—	1	—	2/2/1
<i>Himantopus himantopus</i>	Black-winged Stilt	1	—	—	—	—	—	0/0/1
<i>Recurvirostra avosetta</i>	Avocet	1	—	—	—	—	—	0/0/1
<i>Burhinus oedicephalus</i>	Stone Curlew	—	4	—	—	—	—	0/0/4
<i>Glareola pratincola</i>	Collared Pratincole	1	—	—	—	—	—	0/0/1
<i>Vanellus vanellus</i>	Lapwing	2	—	—	—	—	—	0/0/2
<i>Vanellus spinosus</i>	Spur-winged Plover	1	—	—	—	—	—	0/0/1
<i>Charadrius hiaticula</i>	Ringed Plover	1	—	—	—	—	—	0/0/1
<i>Numenius arquata</i>	Curlew	2	1	—	—	—	—	0/0/3
<i>Philomachus pugnax</i>	Ruff	7	—	—	—	1	—	4/2
<i>Thinocorus rumicivorus</i>	Least Seedsnipe	1	—	—	—	1	—	—
<i>Catharacta skua antarctica</i>	Antarctic Skua	2	—	—	—	—	—	1/1
<i>Larus cirrocephalus poiocephalus</i>	Grey-headed Gull	19	—	6	—	—	4	3/3/15
<i>Larus novaehollandiae</i>	Silver Gull	3	—	—	—	—	—	1/1/1
<i>Larosterna inca</i>	Inca Tern	3	—	—	—	1	—	1/0/1
<i>Alca torda</i>	Razorbill	1	—	—	—	—	—	0/0/1
<i>Uria aalge</i>	Guillemot	4	—	—	—	—	—	0/1/3
<i>Fratercula arctica</i>	Puffin	—	1	—	—	—	—	0/0/1
COLUMBIFORMES								
<i>Columba livia</i>	Rock Dove	1	—	—	—	—	—	0/0/1
<i>Columba guinea</i>	Speckled Pigeon	23	—	3	—	2	2	6/5/11
<i>Columba picazuro</i>	Picazuro Pigeon	5	—	—	—	—	—	1/1/3
<i>Streptopelia roseogrisea</i>	Pink-headed Dove	2	—	—	—	—	—	0/0/2
<i>Streptopelia capicola</i>	Ring-necked Dove	1	—	—	—	—	—	0/0/1
<i>Streptopelia tranquebarica humilis</i>	Dwarf Turtle Dove	1	1	—	—	—	—	2/0
<i>Streptopelia chinensis chinensis</i>	Chinese Necklace Dove	12	—	1	1	2	—	3/3/4
<i>Macropygia ruficeps</i>	Little Cuckoo Dove	1	—	—	—	1	—	—
<i>Chalcophaps indica</i>	Green-winged Dove	1	1	—	—	2	—	—
<i>Phaps elegans</i>	Brush Bronzewing	4	—	—	—	1	—	1/1/1
<i>Ochophaps lophotes</i>	Crested Pigeon	1	1	—	—	—	—	1/1
<i>Geopelia cuneata</i>	Diamond Dove	3	—	—	(1)	1	—	1/0
<i>Zenaidura macroura</i>	Violet-eared Dove	4	—	—	—	—	—	2/2
<i>Columbina cruziana</i>	Golden-billed Ground Dove	2	—	—	—	1	—	0/0/1
<i>Geotrygon versicolor</i>	Mountain Witch Dove	3	3	—	—	1	—	1/1/3
<i>Gallicolumba luzonica</i>	Blood-breasted Pigeon	2	—	—	—	—	—	0/0/2
<i>Ducula badia cuprea</i>	Jerdon's Imperial Pigeon	7	—	—	—	1	—	1/0/5
<i>Ducula bicolor</i>	Pied Imperial Pigeon	1	—	—	—	—	—	0/0/1
PSITTACIFORMES								
<i>Pseudeos fuscata</i>	Dusky Lory	2	—	—	—	—	—	1/1
<i>Trichoglossus ornatus</i>	Ornate Lorikeet	1	—	—	—	—	1	—
<i>Trichoglossus euteles</i>	Perfect Lorikeet	1	2	—	—	—	1	1/1
<i>Lorius lory erythrothorax</i>	Red-breasted Lory	1	—	—	—	—	1	—
<i>Lorius garrulus</i> × <i>Lorius domicellus</i>	Scarlet Lory × Purple-capped Lory	1	—	—	—	—	—	0/0/1
<i>Lorius garrulus flavopalliatum</i>	Yellow-backed Lory	1	—	—	—	—	—	0/0/1
<i>Probosciger aterrimus intermedius</i>	Aru Islands Palm Cockatoo	1	—	—	—	—	—	0/1
<i>Calyptorhynchus funereus</i>	Funereal Cockatoo	1	—	—	—	—	—	0/1
<i>Callocephalon fimbriatum</i>	Gang Gang Cockatoo	1	—	—	—	—	—	1/0
<i>Eolophus roseicapillus</i>	Roseate Cockatoo	1	—	—	—	—	—	1/0
<i>Cacatua leadbeateri</i>	Leadbeater's Cockatoo	2	—	—	—	—	—	1/0/1
<i>Cacatua sulphurea</i>	Lesser Sulphur-crested Cockatoo	2	1	—	—	—	1	1/1
<i>Cacatua galerita galerita</i>	Greater Sulphur-crested Cockatoo	2	—	—	—	1	—	0/0/1
<i>Cacatua moluccensis</i>	Moluccan Cockatoo	1	3	—	—	—	2	1/1
<i>Cacatua alba</i>	White-crested Cockatoo	1	—	—	—	1	—	—
<i>Cacatua sanguinea sanguinea</i>	Bare-eyed Cockatoo	2	—	—	—	—	—	1/1
<i>Cacatua tenuirostris pastinator</i>	Western Slender-billed Cockatoo	3	—	—	—	—	—	2/1
<i>Nymphicus hollandicus</i>	Cockatiel	9	4	1	1	2	—	8/3
<i>Nestor notabilis</i>	Kea	4	—	—	—	—	—	2/2
<i>Electus roratus</i>	Eclectus Parrot	2	—	—	—	—	—	1/1
<i>Polytelis swainsoni</i>	Barraband Parrakeet	—	11	—	—	4	—	3/4
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
<i>Polytelis anthopeplus</i>	Rock Peplar	—	8	—	—	—	—	4/4
<i>Polytelis alexandrae</i>	Princess of Wales' Parrakeet	4	—	—	—	—	—	2/2
<i>Platycercus eximius eximius</i>	Eastern Rosella Parrakeet	2	2	—	—	—	—	2/2
<i>Psephotus haematonotus</i>	Red-rumped Parrakeet	1	—	—	—	—	—	1/0
<i>Neophema bourkii</i>	Bourke's Parrakeet	2	—	—	—	—	—	1/1
<i>Neophema chrysostomus</i>	Blue-winged Grass Parrakeet	—	2	—	—	—	—	1/1
<i>Neophema pulchella</i>	Turquoise Grass Parrakeet	—	2	—	—	—	—	1/1
<i>Neophema splendida</i>	Splendid Grass Parrakeet	1	2	—	—	1	—	1/1
<i>Coracopsis vasa</i>	Vasa Parrot	1	—	—	—	—	—	0/1
<i>Psittacus erithacus</i>	Grey Parrot	4	—	—	—	—	—	2/2
<i>Poicephalus cryptoxanthus cryptoxanthus</i>	Southern Brown-headed Parrot	2	—	—	—	—	—	0/0/2
<i>Poicephalus senegalus</i>	Yellow-vented Senegal Parrot	1	—	—	—	1	—	—
<i>Poicephalus senegalus versteri</i>	Orange-bellied Senegal Parrot	4	—	—	—	3	—	1/0
<i>Poicephalus rueppellii</i>	Ruppell's Parrot	4	—	—	—	—	—	1/1/2
<i>Agapornis fischeri</i>	Fischer's Lovebird	39	—	—	—	5	—	5/2/27
<i>Loriculus vernalis</i>	Vernal Hanging Parrot	4	—	—	—	—	1	2/1
<i>Loriculus galgulus</i>	Blue-crowned Hanging Parrot	2	—	—	—	—	—	2/0
<i>Psittacula eupatria</i>	Alexandrine Parrakeet	2	2	—	—	1	—	1/2
<i>Psittacula krameri krameri</i>	African Ring-necked Parrakeet	3	—	—	—	2	—	1/0
<i>Psittacula krameri manillensis</i>	Indian Ring-necked Parrakeet	2	3	—	—	1	—	2/2
<i>Psittacula cyanocephala</i>	Plum-headed Parrakeet	4	—	5	—	—	—	2/2/5
<i>Psittacula alexandri alexandri</i>	Javan Parrakeet	1	—	—	—	—	—	1/0
<i>Anodorhynchus hyacinthinus</i>	Hyacinthine Macaw	2	—	—	—	—	—	1/1
<i>Ara ararauna</i>	Blue and Yellow Macaw	2	—	—	—	—	—	2/0
<i>Ara macao</i>	Scarlet Macaw	2	—	—	—	—	—	1/1
<i>Ara chloroptera</i>	Green-winged Macaw	3	1(1)	—	—	—	1(1)	1/2
<i>Ara severa severa</i>	Severe Macaw	2	—	—	—	1	—	1/0
<i>Ara nobilis nobilis</i>	Hahn's Macaw	1	—	—	—	—	—	0/0/1
<i>Aratinga erythrogenys</i>	Red-masked Conure	2	—	—	—	—	—	1/1
<i>Aratinga solstitialis</i>	Sun Conure	3	1	—	—	—	—	4/0
<i>Rhynchopsitta pachyrhyncha</i>	Thick-billed Parrot	2	—	—	—	—	—	1/1
<i>Cyanoliseus patagonus byroni</i>	Greater Patagonian Conure	2	1	—	—	—	1	1/1
<i>Pyrrhura frontalis</i>	Red-bellied Conure	2	—	—	—	1	—	0/1
<i>Myiopsitta monachus</i>	Quaker Parrakeet	—	2	—	—	—	—	0/0/2
<i>Brotogeris versicolurus chiriri</i>	Canary-winged Parrakeet	4	—	—	—	1	—	1/1/1
<i>Brotogeris pyrrhopterus</i>	Orange-flanked Parrakeet	2	—	—	—	1	—	0/0/1
<i>Pionites melanocephala</i>	Black-headed Caique	1	—	—	—	—	—	0/1
<i>Pionus menstruus</i>	Red-vented Parrot	1	—	—	—	—	—	0/0/1
<i>Amazona albifrons</i>	White-fronted Amazon Parrot	1	—	—	—	—	—	0/1
<i>Amazona festiva</i>	Festive Amazon Parrot	2	—	—	—	—	—	1/1
<i>Amazona aestiva</i>	Blue-fronted Amazon Parrot	2	—	—	—	—	—	1/0/1
<i>Amazona ochrocephala</i>	Yellow-fronted Amazon Parrot	1	—	—	—	—	—	0/0/1
<i>Amazona amazonica</i>	Orange-winged Amazon Parrot	3	—	—	—	—	—	1/1/1
CUCULIFORMES								
<i>Tauraco corythaix corythaix</i>	Knysna Turaco	1	—	—	—	—	—	1/0
<i>Tauraco corythaix persa</i>	West African Turaco	1	—	—	—	1	—	—
<i>Tauraco erythrolophus</i>	Red-crested Turaco	2	—	—	—	—	—	0/0/2
<i>Tauraco hartlaubi</i>	Hartlaub's Turaco	4	—	—	—	1	—	2/0/1
<i>Tauraco leucotis</i>	White-cheeked Turaco	12	—	—	—	1	—	1/1/9
<i>Eudynamis scolopacea chinensis</i>	Chinese Koel	1	—	—	—	—	—	0/0/1
STRIGIFORMES								
<i>Tyto alba</i>	Barn Owl	2	—	—	—	—	—	1/1
<i>Otus leucotis</i>	White-faced Scops Owl	3	—	—	—	—	—	0/0/3
<i>Bubo virginianus</i>	Great Horned Eagle Owl	2	1	—	—	—	—	1/2
<i>Bubo bubo bubo</i>	European Eagle Owl	4	—	—	—	—	2	1/1
<i>Bubo bubo omisus</i>	Turkmenian Eagle Owl	2	1	—	—	—	1	1/1
<i>Bubo bubo bengalensis</i>	Indian Eagle Owl	2	—	—	—	—	—	1/1
<i>Bubo capensis mackinderi</i>	Kenya Eagle Owl	2	—	—	—	—	—	1/1
<i>Bubo africanus africanus</i>	Spotted Eagle Owl	3	—	2	—	—	3	1/1
<i>Bubo africanus cinerascens</i>	Abyssinian Spotted Eagle Owl	6	—	4	1	1	2	2/2/2
<i>Bubo poensis</i>	Fraser's Eagle Owl	2	—	—	—	—	—	1/1
<i>Bubo vosseleri</i>	Nduk Eagle Owl	3	—	—	—	—	—	1/2
<i>Ketupa zeylonensis</i>	Brown Fish Owl	1	—	—	—	—	—	0/1
<i>Ketupa ketupu</i>	Javan Fish Owl	4	1	—	—	2	—	0/3
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
<i>Scotopelia bouvieri</i>	Vermiculated Fishing Owl	—	2	—	—	—	—	1/1
<i>Pulsatrix perspicillata</i>	Spectacled Owl	3	—	—	—	—	—	1/2
<i>Nyctea scandiaca</i>	Snowy Owl	5	—	2	—	—	3	2/2
<i>Ninox novaeseelandiae</i>	Boobook Owl	4	—	3	—	1	2	2/2
<i>Athene noctua</i>	Little Owl	2	—	3	—	—	3	1/1
<i>Speotyto cunicularia</i>	Burrowing Owl	3	—	—	—	—	—	1/2
<i>Ciccaba woodfordii</i>	African Wood Owl	2	—	—	—	—	—	1/1
<i>Strix aluco sylvatica</i>	Tawny Owl	3	—	—	—	—	1	1/1
<i>Strix hylophila</i>	Rusty Barred Owl	2	—	—	—	—	—	1/1
<i>Asio otus</i>	Long-eared owl	—	2	—	—	—	—	1/1
<i>Asio flammeus</i>	Short-eared Owl	2	—	—	—	—	—	1/1
<i>Aegolius funereus</i>	Tengmalm's Owl	3	—	—	—	1	—	1/1
CORACIIFORMES								
<i>Thalurania furcata furcata</i>	Fork-tailed Woodnymph	—	2	—	—	—	—	1/1
<i>Dacelo novaeguineae</i>	Kookaburra	2	—	—	—	1	1	—
<i>Momotus momota</i>	Blue-crowned Motmot	2	—	2	—	—	—	1/1/2
<i>Coracias caudata</i>	Lilac-breasted Roller	1	—	—	—	—	—	0/0/1
<i>Coracias benghalensis</i>	Indian Roller	1	—	—	—	—	—	0/0/1
<i>Tockus alboterminatus</i>	Crowned Hornbill	2	—	—	—	—	—	0/2
<i>Tockus erythrorhynchus</i>	Red-billed Hornbill	4	1	—	—	—	—	3/2
<i>Tockus deckeni jacksoni</i>	Jackson's Hornbill	2	—	—	—	1	—	1/0
<i>Penelopides panini</i>	Tarctic Hornbill	5	—	2	—	—	—	3/4
<i>Aceros undulatus</i>	Wreathed Hornbill	2	—	—	—	—	—	0/2
<i>Anthracoceros malayanus</i>	Black Hornbill	2	—	—	—	—	—	0/2
<i>Anthracoceros coronatus convexus</i>	Southern Pied Hornbill	1	—	—	—	—	—	0/1
<i>Bycanistes bucinator</i>	Trumpeter Hornbill	2	—	—	—	—	—	1/1
<i>Bycanistes subcylindricus</i>	Black and White Casqued Hornbill	2	—	—	—	—	—	1/1
<i>Buceros bicornis</i>	Great Indian Hornbill	2	—	—	—	—	—	1/1
<i>Buceros hydrocorax</i>	Rufous Hornbill	4	—	—	—	1	—	2/1
PICIFORMES								
<i>Psilopogon pyrolophus</i>	Fire-tufted Barbet	2	—	—	—	1	1	—
<i>Tricholaema lacrymosum</i>	Spotted-flanked Barbet	1	—	—	—	—	—	1/0
<i>Lybius guifsobalito</i>	Black-billed Barbet	2	—	—	—	1	—	0/1
<i>Lybius bidentatus</i>	Double-toothed Barbet	2	—	—	—	—	—	0/1/1
<i>Trachyphonus darnaudii</i>	D'Arnaud's Barbet	1	—	—	—	—	—	0/1
<i>Andigena laminirostris</i>	Laminated Hill Toucan	2	—	—	—	—	—	1/1
<i>Ramphastos vitellinus ariel</i>	Ariel Toucan	1	—	—	—	—	—	1/0
<i>Ramphastos vitellinus culminatus</i>	Yellow-ridged Toucan	1	—	—	—	—	—	1/0
<i>Ramphastos swainsonii</i>	Swainson's Toucan	—	2	—	—	—	—	0/2
<i>Melanerpes candidus</i>	White Woodpecker	2	—	—	—	1	—	1/0
<i>Dinopium benghalense</i>	Golden-backed Woodpecker	1	—	—	—	—	—	0/0/1
PASSERIFORMES								
<i>Procnias nudicollis</i>	Naked-throated Bellbird	1	—	—	—	—	—	1/0
<i>Pitta guajana</i>	Banded Pitta	1	—	—	—	—	—	0/1
<i>Motacilla alba</i>	Pied Wagtail	1	—	—	—	—	—	0/0/1
<i>Pycnonotus leucogenys</i>	White-eared Bulbul	1	—	—	—	—	—	0/0/1
<i>Pycnonotus cafer bengalensis</i>	Red-vented Bulbul	2	—	—	—	—	—	0/0/2
<i>Hypsipetes madagascariensis</i>	Black Bulbul	2	—	4	3	—	—	1/1/1
<i>Chloropsis sonnerati</i>	Greater Green Leafbird	2	—	—	—	2	—	—
<i>Chloropsis aurifrons</i>	Golden-fronted Leafbird	3	—	—	—	1	—	1/1
<i>Irena puella</i>	Fairy Bluebird	4	—	—	—	1	—	1/2
<i>Bombycilla cedrorum</i>	Cedar Waxwing	1	—	—	—	1	—	—
<i>Copsychus malabaricus indicus</i>	White-rumped Shama	1	—	—	—	—	—	1/0
<i>Turdus olivaceus</i>	African Thrush	5	—	—	—	1	—	0/0/4
<i>Turdus pilaris</i>	Fieldfare	1	—	—	—	—	—	0/0/1
<i>Turdoides striatus</i>	Jungle Babbler	1	—	—	—	—	—	0/0/1
<i>Garrulax albogularis</i>	White-throated Jay Thrush	1	—	—	—	—	—	0/0/1
<i>Garrulax leucolophus</i>	White-crested Laughing Thrush	4	4	—	—	2	—	0/0/6
<i>Garrulax pectoralis</i>	Necklaced Laughing Thrush	3	3	—	—	—	—	0/0/6
<i>Garrulax chinensis</i>	Black-throated Laughing Thrush	3	—	—	—	—	—	0/0/3

1 2 3 4 5 6 7

		1	2	3	4	5	6	7
<i>Garrulax cineraceus</i>	Moustached Laughing Thrush	2	—	1	1	—	—	1/1
<i>Garrulax poecilorhynchus</i>	Rufous Laughing Thrush	1	—	—	—	—	—	0/0/1
<i>Garrulax mitratus</i>	Chestnut-capped Laughing Thrush	1	—	—	—	—	—	0/0/1
<i>Garrulax canorus</i>	Melodious Jay Thrush	—	2	—	—	1	—	0/0/1
<i>Leiothrix argentauris</i>	Silver-eared Mesia	1	—	—	—	—	—	0/0/1
<i>Leiothrix lutea</i>	Pekin Robin	5	—	—	—	—	—	1/1/3
<i>Malurus cyaneus</i>	Superb Blue Wren	2	—	—	—	—	—	1/1
<i>Malurus splendens</i>	Splendid Fairy Wren	3	—	—	—	2	—	1/0
<i>Nectarinia amethystina</i>	Amethyst Sunbird	—	2	—	—	2	—	—
<i>Nectarinia sp.</i>	Sunbird	1	—	—	—	1	—	—
<i>Ficedula cyanomelana</i>	Blue and White Flycatcher	—	2	—	—	—	—	1/1
<i>Zosterops palpebrosa</i>	Oriental White-eye	4	—	—	—	1	—	0/0/3
<i>Emberiza bruniceps</i>	Red-headed Bunting	1	—	—	—	1	—	—
<i>Gubernatrix cristata</i>	Green Cardinal	1	—	—	—	—	—	0/1
<i>Paroaria coronata</i>	Red-crested Cardinal	2	—	—	—	—	—	1/0/1
<i>Passerina caerulea</i>	Blue Grosbeak	1	—	—	—	—	—	0/0/1
<i>Passerina leclancherii</i>	Rainbow Bunting	1	—	—	—	1	—	—
<i>Tachyphonus rufus</i>	Black Tanager	1	—	—	—	—	—	1/0
<i>Ramphocelus nigrogularis</i>	Masked Crimson Tanager	1	—	—	—	—	—	1/0
<i>Ramphocelus carbo</i>	Silver-beaked Tanager	1	—	—	—	—	—	1/0
<i>Ramphocelus flammigerus icteronotus</i>	Lemon-rumped Tanager	2	—	—	—	—	—	1/1
<i>Thraupis episcopus</i>	Blue Grey Tanager	2	—	—	—	—	—	0/0/2
<i>Cyanerpes caeruleus</i>	Purple Honeycreeper	1	—	—	—	—	—	0/1
<i>Cyanerpes cyaneus</i>	Red-legged Honeycreeper	1	—	—	—	—	—	0/1
<i>Cacicus melanicterus</i>	Mexican Cacique	2	—	—	—	1	—	0/1
<i>Molothrus bonariensis</i>	Shiny Cowbird	3	—	—	—	—	—	3/0
<i>Fringilla coelebs</i>	Chaffinch	2	—	—	—	—	—	1/1
<i>Carduelis chloris</i>	Greenfinch	6	—	3	—	4	—	1/1/3
<i>Carduelis carduelis</i>	Goldfinch	2	—	—	—	1	—	0/0/1
<i>Acanthis flammea</i>	Redpoll	2	—	—	—	—	—	1/1
<i>Acanthis cannabina</i>	Linnet	1	—	—	—	—	—	0/0/1
<i>Pyrrhula pyrrhula</i>	Bullfinch	1	—	—	—	—	—	1/0
<i>Pyrenestes ostrinus</i>	Black-bellied Seedcracker	2	—	—	—	—	—	1/1
<i>Estrilda caerulescens</i>	Lavender Finch	1	—	—	—	1	—	—
<i>Estrilda melpoda</i>	Orange-cheeked Waxbill	2	—	—	—	1	—	0/0/1
<i>Estrilda troglodytes</i>	Red-eared Waxbill	3	—	—	—	—	—	0/0/3
<i>Amandava amandava</i>	Avadavat	3	—	—	—	1	—	2/0
<i>Amandava subflava</i>	Golden-breasted Waxbill	3	—	—	—	—	—	1/2
<i>Neochmia ruficauda</i>	Starfinch	—	1	—	—	1	—	—
<i>Poephila guttata</i>	Zebra Finch	3	11	—	—	4	2	1/1/6
<i>Poephila bichenovii</i>	Bicheno's Finch	2	—	—	—	1	—	0/1
<i>Chloebia gouldiae</i>	Gouldian Finch	1	—	—	—	1	—	—
<i>Lonchura maja</i>	White-headed Mannikin	1	—	—	—	—	—	0/0/1
<i>Padda oryzivora</i>	Java Sparrow	1	—	—	—	1	—	—
<i>Passer luteus</i>	Golden Sparrow	1	—	—	—	1	—	—
Sp. inc.	Weaver	13	—	—	—	3	—	0/0/10
<i>Ploceus melanogaster stephanophorus</i>	Black-billed Weaver	1	—	—	—	—	—	1/0
<i>Ploceus velatus</i>	Masked Weaver	1	—	—	—	1	—	—
<i>Ploceus cucullatus</i>	Spotted-backed Weaver	1	—	—	—	—	—	1/0
<i>Quelea quelea</i>	Red-backed Weaver	2	—	—	—	—	—	0/0/2
<i>Euplectes orix</i>	Red Bishop	1	—	—	—	1	—	—
<i>Euplectes albonotatus</i>	White-winged Whydah	2	—	—	—	1	—	0/1
<i>Vidua paradisaea</i>	Paradise Whydah	1	—	—	—	1	—	—
<i>Aplonis panayensis strigata</i>	Malayan Glossy Starling	1	—	—	—	1	—	—
<i>Lamprotornis purpureus</i>	Purple Glossy Starling	5	—	—	—	—	—	0/0/5
<i>Lamprotornis chalybaeus</i>	Green Glossy Starling	5	—	—	—	—	—	0/0/5
<i>Cinnyricinclus sharpii</i>	Sharpe's Starling	1	—	—	—	1	—	—
<i>Spreo superbus</i>	Superb Glossy Starling	5	—	—	—	—	—	1/1/3
<i>Creatophora cinera</i>	Wattled Starling	21	—	—	—	5	—	5/6/5
<i>Sturnus pagodarum</i>	Pagoda Starling	1	—	—	—	—	—	0/0/1
<i>Sturnus sericeus</i>	Silky Starling	2	—	—	—	1	—	0/0/1
<i>Sturnus vulgaris</i>	Common Starling	1	—	—	—	—	—	1/0
<i>Sturnus sinensis</i>	Chinese Starling	1	—	—	—	1	—	—
<i>Leucopsar rothschildi</i>	Rothschild's Grackle	3	—	—	—	—	—	1/2
<i>Acridotheres cristatellus cristatellus</i>	Chinese Crested Mynah	1	1	—	—	—	—	0/0/2

1 2 3 4 5 6 7

		1	2	3	4	5	6	7
<i>Gracula religiosa intermedia</i>	Nepal Hill Mynah	5	1	—	—	—	—	3/0/3
<i>Struthidea cinerea</i>	Grey Struthidea	2	—	—	—	—	—	0/1/1
<i>Garrulus glandarius</i>	Jay	2	—	—	—	—	—	0/0/2
<i>Pica pica pica</i>	Magpie	2	—	—	—	—	—	0/0/2
<i>Pyrhocorax graculus</i>	Alpine Chough	2	—	—	—	—	—	0/0/2
<i>Corvus monedula spermologus</i>	Jackdaw	1	—	—	—	—	—	0/0/1
<i>Corvus frugilegus</i>	Rook	1	—	—	—	—	—	0/0/1
<i>Corvus corone corone</i>	Carrion Crow	3	—	—	—	—	—	0/0/3
<i>Corvus corone cornix</i>	Hooded Crow	1	—	—	—	—	—	0/0/1
<i>Corvus corax corax</i>	Raven	3	—	—	—	—	—	1/1/1
<i>Corvus albicollis</i>	White-necked Raven	2	—	—	—	—	—	1/1

DOMESTIC

Common Duck	1	6	—	—	—	1	2/4
Muscovy Duck	1	—	—	—	—	1	—

Total-Birds	1154	150(9)	150	36	160	100(11)	1158
-------------	------	--------	-----	----	-----	---------	------

Reptiles

TESTUDINES

<i>Sternotherus odoratus</i>	Stinkpot	4	—	—	—	—	—	1/1/2
<i>Kinosternon subrubrum</i>	Eastern Mud Terrapin	1	—	—	—	—	—	0/0/1
<i>Kinosternon scorpioides</i>	Scorpion Mud Terrapin	2	—	—	—	—	—	1/0/1
<i>Chrysemys scripta dorbignyi</i>	South American Ornate Terrapin	4	—	—	—	2	—	0/2
<i>Chrysemys scripta elegans</i>	Red-eared Terrapin	4	4	2	—	2	—	2/4/2
<i>Mauremys caspica leprosa</i>	Spanish Terrapin	2	—	—	—	1	—	0/1
<i>Clemmys insculpta</i>	Wood Terrapin	2	—	—	—	—	—	1/1
<i>Emys orbicularis</i>	European Pond Tortoise	4	—	—	—	—	—	3/1
<i>Terrapene carolina</i>	Carolina Box Terrapin	1	—	—	—	—	—	0/1
<i>Terrapene carolina triunguis</i>	Three-toed Box Tortoise	2	—	—	—	—	—	1/1
<i>Geochelone sulcata</i>	African Spurred Tortoise	1	—	—	—	—	1	—
<i>Geochelone gigantea gigantea</i>	Aldabra Giant Tortoise	7	—	—	—	—	1	2/4
<i>Geochelone elephantopus elephantopus</i>	South Albemarle Giant Tortoise	2	—	—	—	—	—	1/1
<i>Geochelone elephantopus nigrita</i>	Porter's Blackish Giant Tortoise	1	—	—	—	—	—	1/0
<i>Geochelone carbonaria</i>	Red-footed Tortoise	2	—	—	—	—	—	1/1
<i>Chelonia mydas</i>	Green Turtle	3	—	—	—	—	—	0/0/3
<i>Eretmochelys imbricata</i>	Hawksbill Turtle	2	—	—	—	—	—	0/0/2
<i>Caretta caretta</i>	Loggerhead Turtle	1	—	—	—	—	—	0/0/1
<i>Chelus fimbriatus</i>	Matamata	3	—	—	—	—	—	1/2
<i>Trionyx hurum</i>	Peacock Soft-shelled Turtle	3	—	—	—	—	—	1/2

CROCODYLIA

<i>Osteolaemus tetraspis tetraspis</i>	West African Dwarf Crocodile	6	—	—	—	—	—	0/0/6
<i>Alligator mississippiensis</i>	American Alligator	3	—	—	—	—	—	1/2
<i>Alligator sinensis</i>	Chinese Alligator	3	—	—	—	—	—	1/2

SAURIA

<i>Phyllurus platurus</i>	Broad-tailed Rock Gecko	1	—	—	—	—	1	—
<i>Gekko gekko</i>	Tokay Gecko	2	1	—	—	—	1	1/1

	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

		1	2	3	4	5	6	7
<i>Ptychozoon kuhli</i>	Flying Gecko	3	—	2	—	1	1	0/0/3
<i>Tarentola mauritanica</i>	Moorish Gecko	—	1	—	—	—	—	0/0/1
<i>Eublepharis macularius</i>	Leopard Ground Gecko	9	4	17	—	1	10	3/7/9
<i>Anolis equestris</i>	Knight Anole	1	—	—	—	—	1	—
<i>Anolis richardii</i>	Richard's Anole	9	—	7	—	2	—	0/0/14
<i>Anolis carolinensis</i>	Carolina Anole	1	9	2	—	—	—	1/0/11
<i>Laemanctus longipes deborrei</i>	Casque-headed Lizard	3	—	—	—	1	—	0/2
<i>Basiliscus vittatus</i>	Banded Basilisk	2	1	7	1	—	2	1/1/5
<i>Basiliscus plumifrons</i>	Plumed Basilisk	—	6	—	—	4	—	1/1
<i>Cyclura cornuta</i>	Rhinoceros Iguana	6	—	—	—	2	—	2/2
<i>Iguana iguana</i>	Common Iguana	1	4	—	—	2	1	0/0/2
<i>Dipsosaurus dorsalis</i>	Desert Iguana	2	—	—	—	1	—	1/0
<i>Sauromalus obesus</i>	Chuckwalla	4	—	3	—	2	—	2/2/1
<i>Sceloporus poinsetti</i>	Crevice Spiny Lizard	1	8	5	2	6	—	1/0/5
<i>Sceloporus orcutti</i>	Granite Spiny Lizard	1	—	—	—	—	—	0/0/1
<i>Agama atra</i>	Somber Agama Lizard	—	6	—	—	1	5	—
<i>Agama atricollis</i>	Black-necked Agama Lizard	—	1	—	—	—	1	—
<i>Physignathus cocincinus</i>	Cochin China Water Dragon	6	—	—	—	1	—	1/2/2
<i>Microsaura damarana S</i>	Knysna Dwarf Chameleon	—	5	9	—	6	4	1/0/3
<i>Egernia striolata</i>	Australian Tree Skink	6	—	2	—	2	—	0/0/6
<i>Trachydosaurus rugosus</i>	Shingle-back	1	6	—	—	2	—	1/2/2
<i>Tiliqua gigas</i>	Giant New Guinea Skink	1	—	—	—	—	1	—
<i>Tiliqua scincoides scincoides</i>	Eastern Blue-tongued Skink	5	6	—	—	1	—	0/0/10
<i>Tiliqua scincoides intermedia</i>	Northern Blue-tongued Skink	2	—	—	—	—	2	—
<i>Mabuya capensis</i>	Three-streaked Skink	—	2	—	—	2	—	—
<i>Mabuya brevicollis</i>	Short-necked Skink	1	—	—	—	—	—	1/0
<i>Mabuya quinquetaeniata</i>	Five-lined Skink	1	1	—	—	—	1	0/0/1
<i>Mabuya striata</i>	Grant's Skink	—	2	—	—	2	—	—
<i>Ctenotus taeniolum</i>	Copper-tailed Skink	—	6	26	—	3	3	0/0/26
<i>Chalcides ocellatus</i>	Eyed Skink	2	—	—	—	—	1	0/0/1
<i>Gerrhosaurus major</i>	Tawny Plated-lizard	4	—	—	—	—	—	0/0/4
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated-lizard	—	2	—	—	1	1	—
<i>Lacerta viridis</i>	Green Lizard	—	1	—	—	—	1	—
<i>Lacerta lepida</i>	Ocellated Lizard	4	2	6	—	1	1	1/1/8
<i>Podarcis lilfordi</i>	Lilford's Wall Lizard	2	—	—	—	1	—	0/0/1
<i>Eremias burchelli S</i>	Burchell's Sand Lizard	—	4	25	1	14	4	0/0/10
<i>Tupinambis nigropunctatus</i>	Black-pointed Tegu	3	—	—	—	1	—	2/0
<i>Trogonophis wiegmanni</i>	Wiegmann's Burrowing Lizard	—	1	—	—	—	—	0/0/1
<i>Varanus exanthematicus albigularis</i>	Bosc's Monitor	1	—	—	—	—	—	1/0
<i>Heloderma suspectum</i>	Gila Monster	2	1	—	—	—	—	1/2
<i>Heloderma horridum</i>	Mexican Beaded Lizard	1	—	—	—	—	1	—
<i>Ophisaurus apodus</i>	Scheltopusik	—	1	—	—	—	1	—
<i>Cordylus giganteus</i>	Sungazer	5	—	—	—	2	—	0/0/3
<i>Cordylus warreni breyeri</i>	Breyer's Girdled Lizard	3	—	—	—	—	—	1/0/2
<i>Cordylus cordylus jonesii</i>	Jones' Armoured Lizard	3	—	—	—	—	1	0/0/2
<i>Pseudocordylus microlepidotus</i>	Small-scaled Girdled Lizard	—	12	—	—	4	—	0/0/8
<i>Platysaurus guttatus</i>	Red-tailed Rock Lizard	1	—	—	—	—	—	1/0
<i>Platysaurus guttatus minor</i>	Lesser Red-tailed Rock Lizard	3	—	—	—	—	—	1/2

SERPENTES

<i>Liasis fuscus</i>	Australian Water Python	2	—	—	—	—	—	1/1
<i>Liasis childreni</i>	Children's Python	—	6	—	—	—	1	2/3
<i>Liasis amethystinus</i>	Amethystine Python	1	—	—	—	1	—	—
<i>Morelia spilotes variegata</i>	Carpet Python	1	2	—	—	1	1	0/0/1
<i>Python reticulatus</i>	Reticulated Python	2	1	—	—	1	1	1/0
<i>Python molurus bivittatus</i>	Malaysian Rock Python	2	5(1)	5	—	2	6	0/2/2
<i>Python regius</i>	Royal Python	4	4(3)	—	—	2	1	3/2
<i>Eunectes murinus</i>	Anaconda	1	—	—	—	1	—	—
<i>Eunectes notaeus</i>	Yellow Anaconda	2	1	—	—	—	—	1/2
<i>Boa constrictor</i>	Boa Constrictor	9	3	—	—	—	6	3/3
<i>Eryx conicus</i>	Russell's Sand-Boa	—	1	—	—	—	1	—
<i>Natrix natrix</i>	Grass Snake	1	—	—	—	1	—	—
<i>Natrix tessellata</i>	Diced Water Snake	—	1	—	—	—	—	0/0/1
<i>Natrix piscator</i>	Checkered Keelback	—	1	—	—	—	1	—
<i>Thamnophis sp.</i>	Garter Snake	—	1	—	—	1	—	—
<i>Thamnophis radix</i>	Plains Garter Snake	2	—	—	—	2	—	—

1 2 3 4 5 6 7

		1	2	3	4	5	6	7
<i>Boaedon fuliginosus</i>	African House Snake	4	1	—	—	1	2	1/1
<i>Drymarchon corais erebennus</i> SS	Texas Indigo Snake	—	1	—	—	—	—	0/0/1
<i>Elaphe guttata guttata</i>	Corn Snake	1	—	—	—	1	—	—
<i>Elaphe obsoleta obsoleta</i>	Black Rat Snake	4	—	5	—	—	7	1/1
<i>Elaphe obsoleta quadrivittata</i>	Yellow Rat Snake	1	—	—	—	—	1	—
<i>Elaphe scalaris</i>	Ladder Snake	11	—	4	—	3	10	1/1
<i>Coluber najadum</i>	Dahl's Whip Snake	2	—	—	—	—	—	0/0/2
<i>Pituophis melanoleucus melanoleucus</i>	Northern Pine Snake	2	2	—	—	—	—	2/2
<i>Hydrodynastes gigas</i>	Boipevassu Snake	8	—	12	1	—	16	2/1
<i>Lampropeltis getulus holbrooki</i>	Speckled King Snake	6	—	2	—	4	4	—
<i>Lampropeltis getulus splendida</i>	Desert King Snake	1	—	—	—	—	1	—
<i>Lampropeltis getulus californiae</i>	Californian King Snake	—	3	2	—	—	3	0/0/2
<i>Lampropeltis triangulum sinaloae</i>	Sinaloan Milk Snake	3	5	—	—	—	1	3/4
<i>Lampropeltis triangulum honduriensis</i> SS	Honduras King Snake	—	4	—	—	—	—	0/0/4
<i>Crotaphopeltis hotamboeia</i>	Herald Snake	—	3	—	—	1	2	—
<i>Malpolon monspessulanus</i>	Montpellier Snake	5	—	—	—	1	—	0/1/3
<i>Dispholidus typus</i>	Boomslang	4	—	—	—	2	—	0/1/1
<i>Notechis scutatus</i>	Tiger Snake	—	4	—	—	2	—	1/1
<i>Bungarus multicinctus</i>	Many-banded Krait	4	—	—	—	2	—	0/0/2
<i>Walterinnesia aegyptia</i>	Innes' Cobra	2	—	—	—	—	—	0/0/2
<i>Naja melanoleuca</i>	Black and White Cobra	2	—	—	—	—	—	2/0
<i>Naja naja</i>	Indian Cobra	10	—	6	—	—	13	1/1/1
<i>Dendroaspis angusticeps</i>	Common Green Mamba	1	—	—	—	—	—	0/1
<i>Dendroaspis polylepis</i>	Black Mamba	4	—	—	—	—	—	2/2
<i>Vipera xanthina palaestinae</i>	Palestine Viper	5	—	—	—	—	1	2/2
<i>Vipera ammodytes meridionalis</i>	Long-nosed Viper	4	—	—	—	—	—	2/2
<i>Bitis arietans</i>	Puff Adder	2	—	—	—	—	—	0/2
<i>Bitis gabonica</i>	Gaboon Viper	4	—	—	—	—	—	2/2
<i>Cerastes vipera</i>	Lesser Cerastes Viper	2	—	—	—	—	—	1/1
<i>Agkistrodon bilineatus</i>	Mexican Cantil	4	—	—	—	—	2	0/0/2
<i>Agkistrodon contortrix mokeson</i>	Northern Copperhead	2	—	—	—	—	—	1/1
<i>Trimeresurus popeorum</i>	Pope's Pit Viper	3	—	—	—	3	—	—
<i>Sistrurus miliarius</i>	Pygmy Rattlesnake	1	—	—	—	—	—	0/0/1
<i>Crotalus atrox</i>	Western Diamond-back Rattlesnake	6	—	—	—	—	5	1/0

Total-Reptiles	301	146(4)	149	5	103	133	355
----------------	-----	--------	-----	---	-----	-----	-----

Amphibians

CAUDATA

<i>Necturus maculosus</i>	Mudpuppy	1	—	—	—	—	—	0/0/1
<i>Andrias japonicus</i>	Japanese Giant Salamander	1	1	—	—	1	—	0/0/1
<i>Triturus cristatus</i>	Crested Newt	10	2	—	—	4	—	0/0/8
<i>Triturus vulgaris</i>	Common Smooth Newt	4	20	—	—	20	—	0/0/4
<i>Taricha granulosa</i>	Rough-skinned Newt	8	—	—	—	3	—	0/0/5
<i>Salamandra salamandra</i>	Fire Salamander	3	—	—	—	1	—	0/0/2
<i>Ambystoma tigrinum</i>	Tiger Salamander	1	—	—	—	—	—	0/0/1
<i>Ambystoma mexicanum</i>	Axolotl	40	—	—	—	4	—	1/1/34
<i>Ambystoma maculatus</i>	American Spotted Salamander	1	—	—	—	—	—	0/0/1

ANURA

<i>Xenopus laevis</i>	Clawed Frog	4	—	—	—	1	—	0/0/3
<i>Pipa pipa</i>	Surinam Toad	3	—	—	—	—	—	0/0/3
<i>Discoglossus pictus</i>	Painted Frog	1	—	—	—	—	—	0/0/1
<i>Bombina variegata</i>	Yellow-bellied Toad	5	—	—	—	—	—	0/0/5
<i>Bufo viridis</i>	Green Toad	6	—	—	—	2	—	0/0/4
<i>Bufo marinus</i>	Cane Toad	3	—	—	—	—	—	0/0/3
<i>Bufo melanostictus</i>	Asiatic Toad	6	—	—	—	2	—	0/0/4

1 2 3 4 5 6 7

		1	2	3	4	5	6	7
<i>Hyla cinerea</i>	Green Tree Frog	3	—	—	—	—	—	0/0/3
<i>Hyla rubra</i>	Daudin's Hyla	—	4	—	—	2	—	0/0/2
<i>Rana ridibunda</i>	Marsh Frog	4	—	—	—	—	—	0/0/4
<i>Rana temporaria</i>	Common Frog	1	—	—	—	—	—	0/0/1
<i>Rana catesbeiana</i>	American Bull Frog	—	3	—	—	1	—	0/0/2
<i>Rana pipiens</i>	Leopard Frog	1	—	—	—	1	—	—
<i>Kassina senegalensis</i>	Senegalese Striped Frog	3	—	—	—	—	—	0/0/3
Total-Amphibians		109	30	—	—	42	—	97

WHIPNADE PARK

Mammals

MARSUPIALIA

<i>Macropus rufogriseus</i>	Red-necked Wallaby	284	—	168	—	138	72	45/48/149
-----------------------------	--------------------	-----	---	-----	---	-----	----	-----------

PRIMATES

<i>Saimiri sciureus</i>	Squirrel Monkey (Black-capped form)	25	—	9	2	—	—	4/17/11
<i>Callithrix jacchus</i>	Common Marmoset	2	—	—	—	1	1(1)	—
<i>Pan troglodytes</i>	Chimpanzee	9	—	—	—	1	—	3/5

RODENTIA

<i>Cynomys ludovicianus</i>	Prairie Marmot	42	—	—	—	—	14	0/0/28
<i>Dolichotis patagonum</i>	Mara	7	—	3	—	5	—	1/1/3

CETACEA

<i>Tursiops truncatus</i>	Bottle-nosed Dolphin	3	—	—	—	—	—	1/2
---------------------------	----------------------	---	---	---	---	---	---	-----

CARNIVORA

<i>Canis lupus</i>	Grey Wolf	22	—	17	4	—	20(4)	4/4/7
<i>Lycaon pictus</i>	Cape Hunting Dog	3	—	—	—	—	—	1/2
<i>Tremarctos ornatus</i>	Spectacled Bear	1	—	—	—	—	—	0/1
<i>Ursus arctos</i>	Brown Bear	4	—	—	—	—	2	1/1
<i>Ursus arctos</i>	Brown Bear (Kodiak form)	2	—	—	—	—	—	1/1
<i>Thalarchos maritimus</i>	Polar Bear	2	—	—	—	—	—	1/1
<i>Ailurus fulgens</i>	Red Panda	2	—	—	—	1	—	1/0
<i>Nasua nasua</i>	Ring-tailed Coati	2	7	—	—	2	—	2/5
<i>Suricata suricatta</i>	Suricate Meerkat	2	—	—	—	—	2(2)	—
<i>Felis lynx</i>	Northern Lynx	4	—	2	—	—	—	3/3
<i>Felis serval</i>	Serval	2	—	—	—	—	—	1/1
<i>Panthera leo</i>	Lion	4	—	9	7	—	1	2/3
<i>Panthera tigris</i>	Tiger (Siberian form)	3	—	2	—	—	—	1/4
<i>Panthera onca</i>	Jaguar	2	—	2	—	1	—	2/1
<i>Acinonyx jubatus</i>	Cheetah	9	4(2)	5	5	—	4	3/6

PINNIPEDIA

<i>Otaria byronia</i>	Southern Sealion	2	—	—	—	—	2	—
<i>Phoca vitulina</i>	Common Seal	1	—	—	—	—	—	0/1
<i>Halichoerus grypus</i>	Grey Seal	—	1	—	—	—	—	0/0/1

PROBOSCIDEA

<i>Elephas maximus</i>	Indian Elephant	1	—	—	—	—	—	0/1
<i>Loxodonta africana</i>	African Elephant	2	—	—	—	—	—	1/1

PERISSODACTYLA

<i>Equus przewalskii</i>	Przewalski's Horse	17	1	4	—	—	8(3)	5/9
<i>Asinus hemionus</i>	Onager (Persian form)	6	—	—	—	1	1	1/3

1 2 3 4 5 6 7

		1	2	3	4	5	6	7
<i>Hippotigris zebra</i>	Mountain Zebra	1	—	—	—	—	1	—
<i>Hippotigris burchelli</i>	Common Zebra	9	1	—	—	2	3	1/4
<i>Hippotigris grevyi</i>	Grevy's Zebra	—	3	—	—	—	—	1/2
<i>Rhinoceros unicornis</i>	Indian Rhinoceros	2	—	—	—	—	—	1/1
<i>Diceros bicornis</i>	Black Rhinoceros	2	—	1	—	—	—	2/1
<i>Ceratotherium simum</i>	White Rhinoceros	14	—	2	1	—	—	3/12
ARTIODACTYLA								
<i>Sus scrofa</i>	Wild Boar	2	4(4)	—	—	1	3	1/1
<i>Phacochoerus aethiopicus</i>	Wart Hog	—	2(2)	—	—	—	—	1/1
<i>Tayassu tajacu</i>	Collared Peccary	13	—	3	3	—	—	5/5/3
<i>Hippopotamus amphibius</i>	Hippopotamus	3	—	—	—	—	—	2/1
<i>Choeropsis liberiensis</i>	Pygmy Hippopotamus	6	—	1	—	1	—	1/4/1
<i>Lama glama</i>	Llama	15	—	7	3	2	1	2/14
<i>Lama guanicoe</i>	Guanaco	18	—	7	—	1	—	6/18
<i>Camelus bactrianus</i>	Bactrian Camel	19	—	5	—	2	4(1)	2/16
<i>Camelus dromedarius</i>	Arabian Camel	7	2	—	—	1	—	1/7
<i>Muntiacus reevesi</i>	Reeves's Muntjac	40	2	—	—	7	4	12/19
<i>Dama dama</i>	Fallow Deer	58	—	19	3	3	6	19/15/31
<i>Axis axis</i>	Axis Deer	30	—	17	8	4	1	18/8/8
<i>Axis porcinus</i>	Hog Deer	24	—	11	3	2	—	11/11/8
<i>Cervus duvauceli</i>	Barasingha	16	—	3	—	1	1	8/8/1
<i>Cervus nippon</i>	Sika Deer (Ryukyu × Japanese form)	11	—	6	—	—	—	5/3/9
<i>Cervus nippon</i>	Sika Deer (Formosan form)	31	—	13	4	4	3	8/11/14
<i>Elaphurus davidianus</i>	Père David's Deer	44	—	16	3	1	2	9/24/21
<i>Alces alces</i>	Moose	3	—	—	—	—	—	1/2
<i>Rangifer tarandus</i>	Reindeer	10	—	6	1	1	3(2)	4/7
<i>Hydropotes inermis</i>	Chinese Water Deer	77	—	50	—	8	43	0/0/76
<i>Giraffa camelopardalis</i>	Giraffe	3	—	—	—	—	—	1/2
<i>Tragelaphus spekei</i>	Sitatunga	14	—	7	4	4	—	6/7
<i>Boselaphus tragocamelus</i>	Nilgai	23	—	14	5	3	8	3/17/1
<i>Bos grunniens</i>	Yak	12	—	1	—	2	—	5/6
<i>Syncerus caffer</i>	African Buffalo	3	4(2)	1	—	2	—	2/4
<i>Bison bonasus</i>	European Bison	10	—	7	1	2	—	2/12
<i>Bison bison</i>	American Bison	11	—	4	—	3	1	5/5/1
<i>Kobus ellipsiprymnus</i>	Common Waterbuck	2	10(1)	3	—	2	3	3/5/2
<i>Hippotragus equinus</i>	Roan Antelope	2	—	—	—	—	2	—
<i>Oryx gazella</i>	Gemsbok	—	7(3)	—	—	4	—	2/1
<i>Oryx tao</i>	Scimitar-horned Oryx	6	3	3	—	—	—	4/8
<i>Damaliscus dorcas</i>	Blesbok	4	4	—	—	2	—	2/4
<i>Connochaetes taurinus</i>	Brindled Gnu	4	—	—	—	1	—	0/3
<i>Antilope cervicapra</i>	Blackbuck	11	—	—	—	—	2(2)	9/0
<i>Gazella thomsoni</i>	Thomson's Gazelle	19	—	—	—	2	1	3/4/9
<i>Ovibos moschatus</i>	Musk Ox	5	—	2	1	1	—	1/4
<i>Ovis musimon</i>	Mouflon	22	—	18	6	3	4	5/17/5
DOMESTIC								
	Ponies	17	3	2	—	1	1	11/9
	Pygmy Donkey	2	—	—	—	—	—	1/1
	Windsor White Goat	20	1	14	3	1	11	7/13
Total-Mammals		1110	59(14)	464	67	224	235(15)	1107

Birds

STRUTHIONIFORMES

<i>Struthio camelus</i>	Ostrich	4	—	—	—	—	2	1/1
-------------------------	---------	---	---	---	---	---	---	-----

RHEIFORMES

<i>Rhea americana</i>	Common Rhea	4	—	1	—	—	1	3/1
-----------------------	-------------	---	---	---	---	---	---	-----

1 2 3 4 5 6 7

		1	2	3	4	5	6	7
CASUARIIFORMES								
<i>Casuarus casuarius</i>	Australian Cassowary	4	—	—	—	—	—	3/1
<i>Dromaius novaehollandiae</i>	Emu	11	—	1	1	3	2	2/2/2
TINAMIFORMES								
<i>Notoprocta perdicaria</i>	Chilean Tinamou	—	14	2	—	1	10	0/0/5
SPHENISCIFORMES								
<i>Aptenodytes patagonica</i>	King Penguin	12	—	1	—	1	—	1/4/7
<i>Eudyptes crestatus</i>	Rockhopper Penguin	7	—	1	—	—	—	3/3/2
<i>Spheniscus humboldti</i>	Humboldt's Penguin	35	—	28	4	2	20	12/12/13
CICONIIFORMES								
<i>Ciconia ciconia</i>	White Stork	6	3	—	—	1	—	5/3
<i>Phoenicopterus ruber roseus</i>	Greater Flamingo	7	—	—	—	—	—	0/0/7
<i>Phoenicopterus ruber ruber</i>	Rosy Flamingo	72	—	12	1	2	—	20/20/41
<i>Phoenicopterus chilensis</i>	Chilean Flamingo	53	—	—	—	2	6	12/12/21
ANSERIFORMES								
<i>Dendrocygna bicolor</i>	Fulvous Whistling Duck	1	—	—	—	—	—	1/0
<i>Cygnus atratus</i>	Black Swan	17	—	—	—	3	1	5/4/4
<i>Cygnus melanocoryphus</i>	Black-necked Swan	1	2	—	—	—	—	1/2
<i>Cygnus cygnus</i>	Whooper Swan	2	—	3	—	—	3	1/1
<i>Coscoroba coscoroba</i>	Coscoroba Swan	2	—	—	—	1	1	—
<i>Anser cygnoides</i>	Chinese Goose	1	—	—	—	—	—	1/0
<i>Anser anser</i>	Greylag Goose	11	—	2	—	2	—	3/5/3
<i>Anser indicus</i>	Bar-headed Goose	38	—	6	—	2	—	4/6/32
<i>Anser caerulescens caerulescens</i>	Lesser Snow Goose	10	—	3	—	3	1	2/3/4
<i>Anser caerulescens atlanticus</i>	Greater Snow Goose	16	—	1	1	—	—	4/4/8
<i>Anser canagicus</i>	Emperor Goose	12	—	1	—	—	—	4/3/6
<i>Branta sandvicensis</i>	Hawaiian Goose	4	—	—	—	—	—	2/2
<i>Branta canadensis</i>	Canada Goose	17	—	9	2	—	5	3/1/15
<i>Branta leucopsis</i>	Barnacle Goose	15	—	2	—	—	—	3/3/11
<i>Branta ruficollis</i>	Red-breasted Goose	24	—	—	—	—	—	15/8/1
<i>Cereopsis novaehollandiae</i>	Cape Barren Goose	17	—	2	1	2	—	6/3/7
<i>Alopochen aegyptiacus</i>	Egyptian Goose	8	—	5	—	—	—	2/2/9
<i>Tadorna ferruginea</i>	Ruddy Shelduck	—	1	—	—	—	1	—
<i>Tadorna cana</i>	South African Shelduck	8	—	9	—	—	—	6/7/4
<i>Tadorna variegata</i>	New Zealand Shelduck	2	—	—	—	—	—	1/1
<i>Tadorna tadorna</i>	Shelduck	7	—	8	—	—	—	3/4/8
<i>Plectropterus gambensis</i>	Spur-winged Goose	2	—	—	—	—	—	1/1
<i>Aix sponsa</i>	Carolina Duck	13	3	—	—	3	1	5/4/3
<i>Aix galericulata</i>	Mandarin Duck	19	—	3	—	1	4	9/5/3
<i>Chenonetta jubata</i>	Maned Goose	4	2	4	1	2	—	2/1/4
<i>Anas penelope</i>	Wigeon	8	—	—	—	—	1	2/3/2
<i>Anas sibilatrix</i>	Chiloe Wigeon	28	—	2	—	3	2	3/3/19
<i>Anas falcata</i>	Falcated Teal	6	—	—	—	1	—	2/3
<i>Anas strepera</i>	Gadwall	3	—	—	—	—	—	1/2
<i>Anas formosa</i>	Baikal Teal	5	—	—	—	—	—	1/1/3
<i>Anas crecca</i>	Teal	—	1	—	—	—	—	1/0
<i>Anas specularioides</i>	Crested Duck	17	—	—	—	3	—	2/3/9
<i>Anas acuta</i>	Pintail	3	—	—	—	—	—	1/2
<i>Anas bahamensis</i>	Bahama Pintail	2	4	—	—	—	1	4/1
<i>Anas querquedula</i>	Garganey	2	—	—	—	—	—	1/1
<i>Anas clypeata</i>	Shoveler	5	2	—	—	1	—	2/4
<i>Netta rufina</i>	Red-crested Pochard	4	—	—	—	—	—	2/2
<i>Aythya ferina</i>	Pochard	6	—	—	—	1	—	3/2
<i>Aythya fuligula</i>	Tufted Duck	5	3	—	—	—	—	3/5
<i>Aythya marila</i>	Greater Scaup	2	—	—	—	—	—	0/2
<i>Somateria mollissima</i>	Eider Duck	9	—	3	—	—	—	3/4/5
<i>Bucephala islandica</i>	Barrow's Goldeneye	3	—	—	—	1	—	0/2
FALCONIFORMES								
<i>Gyps africanus</i>	African White-backed Vulture	1	—	—	—	1	—	—

1 2 3 4 5 6 7

		1	2	3	4	5	6	7
<i>Gyps rueppellii</i>	Ruppell's Griffon Vulture	1	1(1)	—	—	—	—	1/0/1
<i>Gyps fulvus</i>	Griffon Vulture	2	—	—	—	—	—	2/0
<i>Torgos tracheliotus</i>	Lappet-faced Vulture	3	—	—	—	1	—	1/0/1
<i>Sagittarius serpentarius</i>	Secretary Bird	3	—	—	—	1	—	2/0
GALLIFORMES								
<i>Meleagris gallopavo</i>	North American Turkey	27	—	15	—	8	4	0/0/30
<i>Lophortyx gambelii</i>	Gambel's Quail	8	3(3)	—	—	10	—	1/0
<i>Lophophorus impeyanus</i>	Impeyan Pheasant	10	—	—	—	—	1	5/4
<i>Gallus sonneratii</i>	Sonnerat's Jungle Fowl	18	4(4)	—	—	6	1	7/7/1
<i>Lophura nycthemera</i>	Silver Pheasant	5	—	—	—	1	—	1/3
<i>Lophura imperialis</i>	Imperial Pheasant	2	—	—	—	—	—	1/1
<i>Lophura swinhoii</i>	Swinhoe's Pheasant	4	—	3	—	1	—	2/2/2
<i>Crossoptilon mantchuricum</i>	Brown Eared Pheasant	7	—	—	—	—	—	2/2/3
<i>Crossoptilon auritum</i>	Blue Eared Pheasant	2	—	—	—	—	—	1/1
<i>Catreus wallichi</i>	Cheer Pheasant	5	—	1	—	—	1	1/1/3
<i>Syrmaticus mikado</i>	Mikado Pheasant	3	—	—	—	—	—	1/2
<i>Syrmaticus soemmerringi scintillans</i>	Scintillating Copper Pheasant	2	—	—	—	1	1	—
<i>Chrysolophus pictus</i>	Golden Pheasant	14	—	—	—	1	2	6/4/1
<i>Chrysolophus amherstiae</i>	Lady Amherst's Pheasant	4	—	—	—	—	1	2/1
<i>Pavo cristatus</i>	Common Peafowl	127	—	65	—	7	75	0/0/110
<i>Numida meleagris</i>	Helmeted Guineafowl	29	—	—	—	4	—	0/0/25
GRUIFORMES								
<i>Grus grus</i>	Common Crane	3	—	—	—	1	1(1)	1/0
<i>Grus grus lilfordi</i>	Lilford's Crane	1	—	—	—	—	1	—
<i>Grus monacha</i>	Hooded Crane	1	1	—	—	—	—	0/2
<i>Grus canadensis</i>	Sandhill Crane	3	2	—	—	—	—	2/3
<i>Grus japonensis</i>	Red-crowned Crane	5	—	1	—	1	—	3/2
<i>Grus vipio</i>	White-naped Crane	6	1	—	—	—	—	3/4
<i>Grus antigone</i>	Sarus Crane	2	—	—	—	—	2	—
<i>Grus rubicunda</i>	Brolga	2	—	—	—	—	—	0/2
<i>Bugeraus carunculatus</i>	Wattled Crane	4	—	3	—	—	2	1/1/3
<i>Anthropoides virgo</i>	Demoiselle Crane	10	1	—	—	1	5(4)	3/2
<i>Anthropoides paradisea</i>	Stanley Crane	4	1(1)	—	—	1	1(1)	2/1
<i>Balearica pavonina</i>	West African Crowned Crane	6	—	—	—	2	1(1)	2/1
<i>Balearica regulorum</i>	South African Crowned Crane	14	1(1)	—	—	1	1(1)	9/4
<i>Choriotis kori</i>	Kori Bustard	5	—	—	—	—	—	1/4
COLUMBIFORMES								
<i>Goura victoria</i>	Victoria Crowned Pigeon	1	—	—	—	—	—	1/0
PSITTACIFORMES								
<i>Pseudeos fuscata</i>	Dusky Lory	2	—	—	—	—	—	1/1
<i>Trichoglossus haematodus</i>	Swainson's Lorikeet	4	—	—	—	1	—	0/0/3
<i>Eolophus roseicapillus</i>	Roseate Cockatoo	3	—	—	—	—	2	1/0
<i>Cacatua leadbeateri</i>	Leadbeater's Cockatoo	1	—	—	—	—	—	1/0
<i>Cacatua sulphurea</i>	Lesser Sulphur-crested Cockatoo	1	1	—	—	—	—	1/1
<i>Cacatua galerita</i>	Greater Sulphur-crested Cockatoo	3	—	—	—	—	—	1/2
<i>Cacatua sanguinea</i>	Bare-eyed Cockatoo	5	—	—	—	—	1	3/1
<i>Nymphicus hollandicus</i>	Cockatiel	9	—	—	—	1	2	1/1/4
<i>Alisterus scapularis</i>	King Parrot	1	1	—	—	—	—	1/1
<i>Platycercus eximius ceciliae</i>	Golden-mantled Rosella	2	—	—	—	—	—	0/0/2
<i>Platycercus eximius</i>	Eastern Rosella Parrakeet	1	—	—	—	1	—	—
<i>Psephotus haematonotus</i>	Red-rumped Parrakeet	10	—	3	—	—	—	2/2/9
<i>Psittacus erithacus</i>	Grey Parrot	2	—	—	—	—	—	2/0
<i>Psittacula eupatria nipalensis</i>	Alexandrine Parrakeet	1	—	—	—	—	—	1/0
<i>Psittacula krameri manillensis</i>	Indian Ring-necked Parrakeet	9	—	—	—	—	1	2/1/5
<i>Ara ararauna</i>	Blue and Yellow Macaw	2	—	—	—	—	2	—
<i>Ara macao</i>	Scarlet Macaw	4	—	—	—	—	—	2/2
<i>Ara chloroptera</i>	Green-winged Macaw	6	1(1)	—	—	—	1(1)	3/3
<i>Amazona aestiva</i>	Blue-fronted Amazon Parrot	1	—	—	—	—	—	1/0
<i>Amazona ochrocephala</i>	Yellow-fronted Amazon Parrot	—	1	—	—	—	—	0/1
<i>Amazona amazonica</i>	Orange-winged Amazon Parrot	1	2	—	—	—	—	1/0/2
		1	2	3	4	5	6	7

		1	2	3	4	5	6	7
STRIGIFORMES								
<i>Tyto alba</i>	Barn Owl	3	—	—	—	—	—	1/2
<i>Nyctea scandiaca</i>	Snowy Owl	2	—	—	—	—	—	1/1
<i>Strix aluco sylvatica</i>	Tawny Owl	2	—	—	—	—	—	1/1
CORACIIFORMES								
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	2	—	—	—	—	—	1/1
PASSERIFORMES								
<i>Serinus mozambicus</i>	Green Singing Finch	1	—	—	—	1	—	—
<i>Estrilda melpoda</i>	Orange-cheeked Waxbill	4	—	—	—	—	—	2/2
<i>Estrilda troglodytes</i>	Red-eared Waxbill	1	—	—	—	—	—	0/0/1
<i>Amandava subflava</i>	Golden-breasted Waxbill	4	—	—	—	2	—	1/1
<i>Gracula religiosa</i>	Hill Mynah	2	—	—	—	1	—	0/0/1
<i>Urocissa erythrorhyncha occipitalis</i>	Red-billed Blue Pie	2	—	—	—	—	—	0/0/2
Total-Birds		1009	56(11)	200	11	97	171(9)	986

Reptiles

SAURIA								
<i>Iguana iguana</i>	Common Iguana	—	2	—	—	—	—	0/0/2
<i>Tiliqua gerrardi</i>	Pink-tongued Skink	1	—	—	—	—	—	0/0/1
SERPENTES								
<i>Python molurus</i>	Indian Python	1	—	—	—	—	1(1)	—
<i>Python regius</i>	Royal Python	5	—	—	—	2	3(3)	—
Total-Reptiles		7	2	—	—	2	4(4)	3

1 2 3 4 5 6 7

Summary

Regent's Park

	1	2	3	4	5	6	7	Number of Species (excluding domestic)
Mammals	1058	256(15)	868	78	344	507(14)	1253	171
Birds	1154	150(9)	150	36	160	100(11)	1158	345
Reptiles	301	146(4)	149	5	103	133	355	92
Amphibians	109	30	—	—	42	—	97	22
Total	2622	582(28)	1167	119	649	740(25)	2863	630

Estimated number of fishes and invertebrates in the Collection at 31 December 1982:

Fishes	Approx. 1170	170 Species
Invertebrates (excluding locusts, ants and bees)	4600	141 Species

Whipsnade Park

Mammals	1110	59(14)	464	67	224	235(15)	1107	65
Birds	1009	56(11)	200	11	97	171(9)	986	110
Reptiles	7	2	—	—	2	4(4)	3	2
Total	2126	117(25)	664	78	323	410(28)	2096	177

Grand Total—

Zoological Society of London	4748	699	1831	197	972	1150	4959	697*
------------------------------	------	-----	------	-----	-----	------	------	------

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

List of Donors of Animals to the Society

Regent's Park

ANDREWS, MRS M.: 1 Elephant Hawk Moth caterpillar
 AQUALAND: 40 Tompot Blennies, 20 Bullheads, 1 Wrasse, 1 Goby
 BARRETT, MR P.: 1 Batfish, 1 Panther Fish
 BARRINGTON-JOHNSON, MR J.: 20 Newts, 8 Zebra Finches
 BARTLETT, MR T.: 6 Domestic Ducks
 BAXTER, MR B. J.: Stick Insect ova
 BAXTER, MR R. N.: ootheca of *Mantis religiosa*
 BAZLINTON, MR & MRS J., and MISS C.: 1 Daudin's Tree Frog
 BELFORD, MR A.: 1 Sun Conure
 BIRD, MR U. R.: 1 Crab Spider
 BLUE CROSS: 1 Garter Snake
 BRITISH TRANSPORT POLICE: 1 Reticulated Python
 BRONX ZOO: 1 Green Acouchi
 BROWNING, MR G. C.: 1 Shovelnose Catfish
 BURTON, PROFESSOR C.: 8 Praying Mantises
 CAMERON, MR S.: 1 Indian Rock Python
 CAMPBELL, MISS: 1 Crayfish
 CARTER, MR L.: 3 Tufted Ducks
 CHAPMAN, MR B.: 1 Black Widow Spider
 CLARKE, PROFESSOR B.: 86 *Partula* Snails, 6 *Euglandina* Snails
 COOK, MRS P.: 2 Shovelnose Catfish
 COOPER, MR P. J.: 24 Desert Beetles
 DEPARTMENT OF THE ENVIRONMENT: 1 American White Pelican
 DONALD, MRS J.: 2 Alexandrine Parrakeets
 DOWNLEY, POLICE CONSTABLE, & HYAM, POLICE CONSTABLE: 1 Diced Water Snake
 EAVIS, MR R. S.: 6 Australian Rainbow Fish, 1 Silver Shark, 1 Koi Carp
 EDEN, MR M. R.: 28 *Betta macrostoma*
 ENVIRONMENTAL HEALTH OFFICE, ICKENHAM: 1 Spider
 FAIRWEATHER, MR: 1 Indian Rock Python
 FITZSIMMONS, MR C.: 3 Millipedes, 6 Orb Spiders, 2 Web Spiders, 1 Shield Bug
 FULTON, MRS: 3 Fat Dormice
 GALLAGHER, MRS D.: 1 Koi Carp, 2 Lion Heads, 2 Goldfish
 GARNETT, on behalf of the late Mrs P. A.: 1 Sulphur-crested Cockatoo
 GILMORE, MR D.: 1 Indian Rock Python
 GRAVES, MR & MRS: Prickly Stick Insects
 GRAYSON, MR M.: 1 Scheltopusik
 GREY-WALLACE, MS J.: 8 White-toothed Shrews
 HANDEN, MR P.: Hissing Cockroaches, African Field Crickets
 HAWKSWORTH, MR B.: 1 American Catfish
 HAWK TRUST: 1 Long-eared Owl
 HAZELL, MR P.: 1 Melodious Jay Thrush
 HEATH, MR G.: 3 Praying Mantis
 HEATH, MR J.: 2 Praying Mantis
 HOLLOWAY, MS F.: 30 eggs *Aplopus* sp.
 HOWES, MRS R.: 1 Bird-eating Spider

HUMPHREYS, MISS I. & MISS M.: 42 cocoons of the Atlas Silk Moth
 HUMPHRYS, MR D. F.: 2 batches of Triton eggs
 HURFORD, MRS G.: 1 Tokay Gecko
 INSTITUTE OF FRESHWATER RESEARCH, DROTTHINGHOLM, SWEDEN: 6 Burbot
 JONES, MR R. W.: 1 Spiny Puffer Fish, 1 Dragon Fish
 KING, MR D. & STOTT, R.: 5 Catfish
 KINGSLEY, MRS V.: 2 Quaker Parrakeets
 LEY PARK INFANTS SCHOOL: Robin Silk Moth caterpillars
 LITTLE, MR U. B.: 1 Florida Bullfrog
 LIVERPOOL SCHOOL OF TROPICAL MEDICINE: 6 Cotton Rats, 6 White-footed Mice, 2 Long-tailed Thicket Rats
 LOPEZ, MRS S.: 2 Indian Ring-necked Parrakeets
 McCULLOUGH, MISS N.: 1 Star Finch
 McHALE, POLICE CONSTABLE: 1 Californian King Snake
 MAPLESON, MRS B.: Privet Stick Insects
 MAZHARY, MR M. F.: 1 Nepal Hill Mynah
 MEAD, MR G.: 1 Yellow Anaconda, 1 Boa Constrictor
 MILES, MR A.: 1 Red-bellied Piranha
 MILLAR, MISS V.: 1 Royal Python
 MORRIS, MR I.: 2 Boa Constrictors
 NEWMAN, MR C.: 1 Bird-eating Spider
 NOLAN, MR M.: 4 Honduras King Snakes
 NORFOLK WILDLIFE PARK: 4 Stone Curlews
 NORTH OF ENGLAND ZOOLOGICAL SOCIETY (CHESTER ZOO): 4 Chilean Tinamous
 OAKMAN, MR R.: 1 Snowflake Moray Eel
 PANTRINI, MR: 1 Longnosed Gar Pike
 PATCHING, MR & MRS R.: 1 Tree Frog
 POND, DR CAROLINE: 1 Buprestid Beetle, 14 Scarab Beetles
 PUGSLEY, POLICE CONSTABLE: 1 Checkered Keelback
 REES, MS E.: 3 Zebra Finches
 RISLEY, MR D.: 4 Red-eared Terrapins
 ROSS, MR J.: 1 American Catfish, 1 Comet, 2 Black Moors, 1 Fantail, 2 Chinese Loaches, 4 Indian Loaches, 2 Aquatic Snails
 ROYAL NAVY 'HMS BRISTOL': 1 King Cormorant
 RSPCA: 1 Puffin, 1 Green Lizard
 SANDERS, MR I.: 2 Tiger Oscars, 2 Black Catfish
 SANDOWN ZOO: 1 Texas Indigo Snake
 SASSE, MR D.: 1 Cockatiel
 SCHOFIELD, DR C. J.: 2 Desert Scorpions
 SCOTT, MRS C.: 1 Long-eared Owl, Tree Frogs
 SHALDON ZOO: 1 Dwarf Turtle Dove, 1 Melodious Jay Thrush, 1 Necklaced Laughing Thrush, 1 Crested Pigeon, 1 Mountain Witch Dove
 SMULDERS, MISS H.: Bull Frogs
 SPITALFIELDS MARKET PORTERS: 1 Moorish Gecko

SRI LANKA, THE ZOOLOGICAL GARDENS OF: 1 Asian Elephant
 STEINHART AQUARIUM: 4 Leopard Sharks
 STOKER, MR C.: 1 Moluccan Cockatoo
 SUSSMAN, MS S.: 2 Crested Newts
 TARONGA ZOOLOGICAL PARK: Funnel-web Spiders, 4 Tiger Snakes, 2 Carpet Pythons, 6 Copper-tailed Skinks
 TOYOTA: 1 Crab Spider
 WAINE, MR D.: 1 Moluccan Cockatoo
 WENDELL PARK SCHOOL: 1 Tree Frog
 WILLIS, MR L.: 1 Russell's Sand Boa
 WLCP: 3 Red-necked Wallabies

Whipsnade Park

BURGESS, MRS B. J.: 1 Orange-winged Amazon Parrot
 DICKMAN, MRS G.: 1 Yellow-fronted Amazon Parrot
 FRENCH, MRS M.: 2 Guinea Pigs
 GAHAN, MR W. L.: 2 Spur-thighed Tortoises
 GOLDTHORPE, MRS B. V.: 1 Tortoise
 LADY HOGG: 1 Ruddy Shelduck
 MOSS, MR L. F.: 1 Common Iguana
 OSTLER, MR R. B.: 1 Common Iguana
 SMAILES, MRS B. G.: 2 Tortoises
 TILEY, MR M.: 10 Pygmy Hamsters
 TURK, MR A.: 1 Orange-winged Amazon-Parrot
 WARD, MRS H.: 1 Lesser Sulphur-crested Cockatoo

Financial Statements

Income and Expenditure Account For the year ended 31st December 1982

	1982	1981
	£	£
DEPARTMENT OF THE ENVIRONMENT — Grants	1,600,000	—
GENERAL ACTIVITIES		
<i>Income</i>		
Members subscriptions and fees	97,440	97,342
Less cost of Journal	(11,374)	(10,981)
Transfer: Composition Fees	500	370
Interest and dividends	92,062	69,024
Income from Special Funds (note 10)	11,614	11,546
Donations:		
a) Members Committee	40,520	—
b) Other	19,908	23,897
	<u>250,670</u>	<u>191,198</u>
<i>Expenditure</i>		
Department of the Environment —		
Surveys	46,707	—
Administration	63,042	63,020
Bank Interest	233,746	147,012
	<u>343,495</u>	<u>210,032</u>
Net deficit on General Activities	(92,825)	(18,834)

NET INCOME AND EXPENDITURE OF SPECIFIC ACTIVITIES OF THE SOCIETY (Note 3)

	<i>Income</i>	<i>Expenditure</i>		
	£	£		
Zoological Gardens:				
a) Regent's Park	2,177,519	3,272,546	(1,095,027)	(407,602)
b) Whipsnade Park	642,988	1,144,180	(501,192)	(411,537)
Education & XYZ Club	77,721	73,295	4,426	(7,665)
Library	—	68,876	(68,876)	(64,189)
Publications	239,637	224,757	14,880	(28,158)
Institute of Zoology	537,456	739,065	(201,609)	(157,857)
	<u>3,675,321</u>	<u>5,522,719</u>		
Excess of expenditure over income			<u>(340,223)</u>	<u>(1,095,842)</u>

NOTE

The layout of the Accounts has been changed from that previously used so as to simplify the income and expenditure account and the balance sheet, which are now accompanied by more comprehensive notes and a statement of source and application of funds.

Where necessary the corresponding figures for 1981 have been adjusted to give a fair comparison with those for 1982.

Balance Sheet as at 31st December 1982

		1982		1981	
	Note	£	£	£	£
FIXED ASSETS					
Freehold property at cost					
less sales	2(c)	113,213		113,213	
Less aggregate depreciation		<u>113,213</u>		<u>113,213</u>	
			—		—
INVESTMENTS AT COST	5		1,091,166		1,031,249
(Market value: £1,361,108 (1981: £1,124,222))					
CURRENT ASSETS					
<i>Stocks</i>	2(d)				
Scientific publications		1,000		1,000	
Catering		12,096		45,600	
		<u>13,096</u>		<u>46,600</u>	
Sundry debtors & payments in advance		191,280		257,378	
Bank balances, deposit & cash		58,918		14,359	
		<u>263,294</u>		<u>318,337</u>	
CURRENT LIABILITIES					
Sundry creditors & receipts in advance		684,562		408,266	
Bank overdraft	6	1,612,155		1,609,150	
		<u>2,296,717</u>		<u>2,017,416</u>	
			(2,033,423)		(1,699,079)
			<u>(942,257)</u>		<u>(667,830)</u>
FUNDS AND RESERVES					
Funds	7		438,931		404,227
Accumulated Deficit	8		(1,381,188)		(1,072,057)
			<u>(942,257)</u>		<u>(667,830)</u>

BUXTON
Treasurer

Statement of source and application of funds for the year ended 31st December 1982

	1982		1981	
	£	£	£	£
Source of funds				
Income and Expenditure account				
Deficit		(340,223)		(1,095,842)
Less items not involving the movement of Funds				
Composition Fund — Transfer		500		370
Total absorbed by operations		<u>(340,723)</u>		<u>(1,096,212)</u>
Other sources of funds				
Surplus on sale of investments	44,522		20,709	
Additional capital: Scientific Fund	20,000		—	
Fantham Bequest — income	389		315	
Benevolent Fund — income	143		63	
Composition fees received	1,242	66,296	1,916	23,003
		<u>(274,427)</u>		<u>(1,073,209)</u>
Application of funds				
Net increase in investments		(59,917)		(32,507)
		<u>(334,344)</u>		<u>(1,105,716)</u>
Movement in working capital and liquid funds				
Increase (decrease) in				
Stocks	(33,504)		(46,059)	
Debtors	(66,098)		22,600	
(Increase) decrease in				
Creditors	(276,296)	(375,898)	193,164	169,705
Decrease (increase) in net borrowing				
(Increase) in bank overdraft	(3,005)		(1,277,826)	
Increase in bank balances and deposit	44,559		2,435	
(Decrease) in cash	—	41,554	(30)	(1,275,421)
		<u>(334,344)</u>		<u>(1,105,716)</u>

Report of the Auditors

We have audited the financial statements on page 49 to 56 in accordance with approved auditing standards.

As stated in note 1(b), the accounts have been prepared on a going concern basis which assumes that financial support will continue to be provided by the Department of the Environment.

Subject to the above, in our opinion the financial statements show a true and fair view of the state of affairs at 31st December, 1982, and of the deficit and source and application of funds for the year ended on that date.

FRASER KEEN *Chartered Accountants*
4, London Wall Buildings, London EC2M 5NT
15th March 1983

Notes to the Accounts

1. BASIS OF ACCOUNTING

(a) The Society is a recognised charity governed by its Charter and Byelaws. The accounts of the Society have been prepared under the historical cost convention.

(b) The Secretary of State for the Environment has provided financial support during the fiscal years 1981/2 and 1982/3 to enable the Society to operate within the agreed bank facilities while consideration is given by the Government to the Operational Plan for the period 1983-86 submitted by the Society.

On the assumption that the financial support by the Department of the Environment will continue, the accounts have been prepared on a going concern basis.

2. ACCOUNTING POLICIES

A summary of the main accounting policies is set out below:

(a) Consolidation

The accounts 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 4).

(b) Special Funds

Special funds of the Society which have conditions attached to their use are not included in the accounts. Details of these are set out in note 10.

(c) Fixed Assets

Freehold property is shown at original cost less sales and is fully depreciated. Other Buildings, Plant & Vehicles, Fittings and Furnishings are written off in the year of purchase.

(d) 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 & garden stocks and the Library; stocks of scientific publications are included at nominal valuation.

(e) Pensions Scheme Arrangements

The pension scheme of the Society is maintained as a separate Trust Fund. Payments made to the fund and charged in these accounts are based on actuarial advice. The fund is actuarially valued every three years.

3. INCOME AND EXPENDITURE RELATING TO SPECIFIC ACTIVITIES

3. A: Zoological Gardens

	<i>Regent's Park</i>		<i>Whipsnade Park</i>	
	1982	1981	1982	1981
	£	£	£	£
<i>Income</i>				
Admission of visitors	2,205,054	2,270,678	531,444	549,294
Admission of cars			64,789	63,846
Catering (note 4)	(116,116)	46,651	22,823	13,525
Consultancy Income	24,219	25,745	—	—
Miscellaneous Zoo income	64,362	39,872	23,932	13,403
	<hr/>	<hr/>	<hr/>	<hr/>
	2,177,519	2,382,946	642,988	640,068
	<hr/>	<hr/>	<hr/>	<hr/>
<i>Expenditure</i>				
Rates & Insurance	58,394	48,950	15,924	13,769
Wages & Salaries	1,518,859	1,463,038	582,996	553,185
Pensions	169,399	133,969	72,600	60,395
Provisions	196,137	187,269	133,444	113,227
Major Repairs & Renewals	146,726	46,151	—	—
Works	153,637	106,073	64,310	35,698
Gardening & Forestry	5,474	3,775	5,095	1,970
Miscellaneous direct expenses	92,074	53,635	58,182	43,942
Fuel, light, water & transport	446,097	356,373	107,700	102,553
Administration	114,849	112,777	14,365	15,273
Advertising	142,671	79,853	47,050	60,788
Staff Canteen	75,540	47,468	4,342	13,000
Veterinary services	84,368	94,667	21,092	23,667
Research services	68,321	56,550	17,080	14,138
	<hr/>	<hr/>	<hr/>	<hr/>
	3,272,546	2,790,548	1,144,180	1,051,605
	<hr/>	<hr/>	<hr/>	<hr/>
(Deficit)	(1,095,027)	(407,602)	(501,192)	(411,537)

3. B: Education and XYZ Club

	1982	1981
	£	£
<i>Income</i>		
Education visits & Club Fees	77,721	64,658
	<hr/>	<hr/>
<i>Expenditure</i>		
Salaries	66,573	63,943
Direct expenses	5,003	5,370
Overheads: miscellaneous	1,719	3,010
	<hr/>	<hr/>
	73,295	72,323
	<hr/>	<hr/>
Surplus (Deficit)	4,426	(7,665)

3. C: Library

	1982	1981
<i>Expenditure</i>		
Salaries	42,311	41,520
Books, periodicals	26,565	22,669
	<hr/>	<hr/>
	68,876	64,189
	<hr/>	<hr/>

3. D: Publications

	Journal Transactions Symposia	International Zoo Yearbook	Zoological Record Nomenclator	1982 Total	1981 Total
<i>Income</i>	£	£	£	£	£
Sales	89,640	36,860	113,137	239,637	393,540
<i>Expenditure</i>					
Salaries	18,020	24,212	28,266	70,498	119,804
Paper & printing	53,795	17,992	65,265	137,052	257,519
Other direct materials & services	—	170	16,782	16,952	42,762
Overheads: miscellaneous	255	—	—	255	1,613
	72,070	42,374	110,313	224,757	421,698
Surplus (Deficit)	17,570	(5,514)	2,824	14,880	(28,158)

3. E: Institute of Zoology

	Veterinary Science	Wellcome Labs	Nuffield Labs	1982 Total	1981 Total
<i>Income</i>	£	£	£	£	£
Fees received	6,220	—	—	6,220	5,508
Scientific fund — investment income	—	40,207	—	40,207	38,022
Grants: specific projects	10,687	128,543	183,184	322,414	255,772
Wolfson fund	—	—	—	—	50,000
ABRC Contribution	26,800	56,950	83,750	167,500	155,000
Donations	—	—	1,115	1,115	1,104
	43,707	225,700	268,049	537,456	505,406
<i>Expenditure</i>					
Salaries	124,679	223,002	351,419	699,100	667,774
Other direct materials & services	17,944	55,974	82,849	156,767	135,229
Equipment	1,960	24,088	25,666	51,714	33,356
Overheads: miscellaneous	4,584	8,037	9,724	22,345	15,926
	149,167	311,101	469,658	929,926	852,285
LESS: Transfers to Zoological Gardens:					
Regent's Park	(84,368)	(68,321)	—	(152,689)	(151,217)
Whipsnade Park	(21,092)	(17,080)	—	(38,172)	(37,805)
	43,707	225,700	469,658	739,065	663,263
(Deficit)	—	—	(201,609)	(201,609)	(157,857)

4. 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:

	Regent's Park	Whipsnade Park	Total
	£	£	£
Zoo Restaurants Ltd	11,563	4,300	15,863
Zoo Enterprises Ltd	57,814	20,906	78,720
	69,377	25,206	94,583
Less loss on catering services	(185,493)	(2,383)	(187,876)
	(116,116)	22,823	(93,293)

The catering loss at Regent's Park includes the redundancy and other payments made to staff when the catering was transferred to Grandmet Catering Services Ltd amounting to £54,242.

5. INVESTMENTS

An analysis of investments at valuation is as follows:—

Gilt-edged and other fixed interest securities	£ 320,985
United Kingdom Equities	1,001,668
Uninvested cash balances	38,455
	<u>1,361,108</u>
Market value at 31st December 1982	1,361,108

These investments are attributed to:—

Main Fund	818,588
Scientific Fund	536,165
Fantham Bequest	6,355
	<u>1,361,108</u>

6. BANK OVERDRAFT

The bank overdraft is secured by charges over the Society's freehold interest in the Whipsnade Estate, and the Main Fund investments.

7. FUNDS

	Heer Bequest	Fantham Bequest	Scientific Fund	Composition Fund	Staff Benevolent Fund	Total
	£	£	£	£	£	£
Balance at						
1st January 1982	91	7,907	368,057	26,123	2,049	404,227
Investment Income	—	389	—	—	143	532
Additional Capital received	—	—	20,000	1,242	—	21,242
Profit/(loss) on sale of investments	—	(1,581)	15,011	—	—	13,430
Transfer to Income & Expenditure Account	—	—	—	(500)	—	(500)
	91	6,715	403,068	26,865	2,192	438,931

8. ACCUMULATED DEFICIT

Balances at 1st January 1982 as re-stated:

	£	
General Reserve	352,527	
Major Repairs & Renewals Fund	316,657	
Pension Contributions Reserve	100,000	
Publications Funds	(79,795)	
Accumulated Deficit	<u>(1,761,446)</u>	(1,072,057)

Surplus on sale of investments

31,092

Deficit for year from Income & Expenditure Account

(340,223)

Balance at 31st December 1982

£(1,381,188)

9. PENSION FUND

At the last triennial actuarial valuation as at 30th June 1981, the Pension Fund showed a surplus of assets over liabilities and was solvent in terms of the benefits to be provided on winding-up. Consideration is being given to increased contributions.

10. 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 £11,557.

(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.

Summary of Scientific and Educational Activities—for the year ended 31st December 1982

	INSTITUTE OF ZOOLOGY				OTHER SCIENTIFIC AND EDUCATIONAL ACTIVITIES						Total 1981
	Department of Veterinary Science	Wellcome Laboratories	Nuffield Laboratories	Total	Education Scheme and Young Zoologists' Club	Library	Journal, Transactions and Symposia	International Zoo Yearbook	Zoological Record and Nomenclator	Total (incl. Institute of Zoology)	
	£	£	£	£	£	£	£	£	£	£	£
EXPENDITURE											
Salaries	124,679	223,002	351,419	699,100	66,573	42,311	18,020	24,212	28,266	878,482	893,041
Paper and printing	—	—	—	—	3,668	—	53,795	17,992	65,265	140,720	260,762
Other direct materials and services	17,944	55,974	82,849	156,767	1,335	26,565	—	170	16,782	201,619	202,787
Equipment	1,960	24,088	25,666	51,714	—	—	—	—	—	51,714	33,356
Overheads	4,584	8,037	9,724	22,345	1,719	—	255	—	—	24,319	20,549
	<u>149,167</u>	<u>311,101</u>	<u>469,658</u>	<u>929,926</u>	<u>73,295</u>	<u>68,876</u>	<u>72,070</u>	<u>42,374</u>	<u>110,313</u>	<u>1,296,854</u>	<u>1,410,495</u>
INCOME											
Fees received	6,220	—	—	6,220	—	—	—	—	—	6,220	5,508
Scientific Fund: investment income	—	40,207	—	40,207	—	—	—	—	—	40,207	38,022
Grants: specific research projects	10,687	128,543	183,184	322,414	—	—	—	—	—	322,414	255,772
Wolfson Foundation grant	—	—	—	—	—	—	—	—	—	—	50,000
A.B.R.C. Contribution	26,800	56,950	83,750	167,500	—	—	—	—	—	167,500	155,000
Donations	—	—	1,115	1,115	—	—	—	—	—	1,115	1,104
Education visits and club fees	—	—	—	—	77,721	—	—	—	—	77,721	64,658
Sale of publications	—	—	—	—	—	—	89,640	36,860	113,137	239,637	393,540
	<u>43,707</u>	<u>225,700</u>	<u>268,049</u>	<u>537,456</u>	<u>77,721</u>	<u>—</u>	<u>89,640</u>	<u>36,860</u>	<u>113,137</u>	<u>854,814</u>	<u>963,604</u>
EXPENDITURE MET BY SOCIETY											
	<u>105,460</u>	<u>85,401</u>	<u>201,609</u>	<u>392,470</u>	<u>(4,426)</u>	<u>68,876</u>	<u>(17,570)*</u>	<u>5,514</u>	<u>(2,824)</u>	<u>442,040</u>	<u>446,891</u>
	<u>149,167</u>	<u>311,101</u>	<u>469,658</u>	<u>929,926</u>	<u>73,295</u>	<u>68,876</u>	<u>72,070</u>	<u>42,374</u>	<u>110,313</u>	<u>1,296,854</u>	<u>1,410,495</u>

Notes:

- * Surplus arising from the Society's equal division of income and of production expenditure in the joint publishing operation with Academic Press Inc.

