21. EVENTS SINCE THE BALANCE SHEET DATE

On 17th June 1992, the Society announced that London Zoo would close at the end of September 1992. The costs of this closure will b borne by the Zoological Society of London.

22. OWNERSHIP

The Company is wholly owned by the Zoological Society of London, which is incorporated by Royal Charter and is a registered chari No. 208728.

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THE ZOOLOGICAL SOCIETY OF LONDON

ANNUAL REPORT 1992–1993

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This Report covers the period from 1 April 1992 to 31 March 1993.

Published by

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THE ZOOLOGICAL SOCIETY OF LONDON

MISSION STATEMENT

To promote the worldwide conservation of animal species and their habitats by stimulating public awareness and concern through the presentation of living collections, by relevant research and by direct action in the field.

MISSION AIMS

1. To foster public awareness of the variety and diversity of the living world through imaginative exhibits featuring live animals in appropriate environments.
2. To maintain and breed species with a high conservation and education value and to link this to a comprehensive programme of learning for all age groups, but particularly for children of school age.
3. To increase our understanding of the biology of rare animal species, concentrating on veterinary research, reproduction, genetics, ethology and ecology.
4. To initiate and run practical conservation programmes chosen in accordance with accepted international criteria for effective and high priority conservation.
5. To promote the understanding of conservation issues and their relationship to the development of the world's poorest countries and to promote the application of sound scientific principles to wildlife management.
6. To ensure that the highest standards of husbandry and welfare are employed wherever we care for animals and that techniques to further improve the husbandry of these species are studied and communicated to others.
7. To co-operate with other responsible societies and organisations promoting conservation on a worldwide basis.
8. To disseminate new knowledge in Zoology and field conservation through publications, symposia, scientific meetings and maintenance of the library.
9. To make awards of prizes and medals for distinguished work in Zoology and Conservation.

ABOUT THE SOCIETY

The Society was founded in 1826 by Sir Stamford Raffles, Sir Humphry Davy and other eminent naturalists. The Society is a charity incorporated by Royal Charter, granted in 1829. A new Charter was issued in 1963.

The Society was formed as a scientific society and this remains its prime purpose. It now comprises five divisions which act together in furtherance of the aims set out in the Mission Statement.

London Zoo (opened 1828) and **Whipsnade Wild Animal Park** (opened 1931) co-operate in the management and exhibition of the Society's animal collections. They are amongst the world's leading wildlife visitor attractions and enjoy an enviable reputation in the breeding of endangered species.

The Education Departments at London Zoo and Whipsnade are instrumental in the provision of knowledge to the visitor. There is an extensive programme for schools and many other courses and events are arranged at both locations.

The Institute of Zoology was formed in 1977 to link the Wellcome Institute of Comparative Physiology, the Nuffield Institute of Comparative Medicine (both founded by the Society during the 1960's) and the Veterinary Hospitals at London Zoo and Whipsnade Park. A wide range of research is undertaken by the Institute much of it in close co-operation with the Zoos. It encompasses work on ecology, genetics, reproductive biology, wildlife disease and veterinary medicine, all of which is directed towards the conservation of rare and threatened species and the highest standards of animal care.

The Conservation and Consultancy Division was created in 1992 and builds on a variety of overseas field work and zoo design work initiated some 15 years ago. Activity is concentrated in Africa and the Middle East. The work encompasses direct support for threatened species such as elephant and rhino, training of nationals, secondment of skilled staff and management of multidisciplinary projects in conservation research and related field operations.

The Learned Society, as the core division, is responsible for encouraging the spread of knowledge by arranging discussion meetings, by publishing the results of zoological research and by maintaining a library.

Scientific Meetings, at which the results of new research are communicated and discussed, are held on eight occasions during the year. Symposia on special subjects of international interest are also arranged and generally occupy two days of contributions and discussions.

The Society's publications include:

The *Journal of Zoology*, which publishes original research in all fields of zoology, from international contributors. The wide variety of the contents provides a broad view of trends and developments in the subject.

The *Symposia* series of books, each of which contains the papers presented at a Symposium and thus covers a particular topic in depth.

The *International Zoo Yearbook*, a work of reference as well as an authoritative record of developments in the zoo world.

The *Zoological Record*, a comprehensive annual bibliography of zoological literature with subject and systematic indexes. The *Record* is published in conjunction with BIOSIS, Philadelphia. Produced continuously since 1864, it is an un-rivalled source of information on zoological research world-wide.

The **Library** was established soon after the Society's foundation and is now one of the major zoological libraries in the world. It provides a full library service to members of the Society and to its staff. It also houses a unique archive.

ILLUSTRATIONS

Cover: Tanysiptera carolinae by Henry Jones (1838–1921). Framed print obtainable from the Society's Library.

Photographs: Michael Lyster, Peter H Denton, Ray Charter, Terry Dennett, David Jones and Linda Walker

EDITORIAL: Peter H. Denton and Marcia A. Edwards

REPORT OF THE COUNCIL

The Council has pleasure in presenting its 164th Annual Report to the Annual General Meeting of the Society to be held on 22 September 1993 at 3.00 pm in the Society's Meeting Room at Regent's Park.

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PATRON: HER MAJESTY THE QUEEN

COUNCIL 1992–1993

President: Field Marshal Sir John Chapple, GCB, CBE
Treasurer: P Holwell, BSc (Econ), FCA (to 9.12.92)
P J Wrangham (from 9.12.92)
Secretary: Sir Barry Cross, CBE, MA, PhD, ScD, FIBiol, FRS (to 9.12.92)
Professor R McNeill Alexander, PhD, DSc, FIBiol, FRS (from 9.12.92)
Professor D J Bellamy, PhD, FLS, FIBiol (to 5.10.92)
Dr M R Brambell, VetMB, PhD (from 2.11.92)
Dr S Cobb, BA DPhil (from 15.10.92)
G J Cutting (from 2.11.92)
J C Edwards MA
Professor A S D Farmer, PhD, CBiol, FIBiol, FLS, MIFM, ARPS (from 2.11.92)
Professor T R Halliday, MA, DPhil
P Hardy, MP (to 5.10.92)
Professor M P Hassell, MA, DPhil, DSc, FRS
Professor P A Jewell, BSc(Agric), MA, PhD, CBiol, FIBiol, *Vice President* (to 2.11.92)
Professor J R Krebs, DPhil, FRS (to 15.10.92)
Professor A M Lucas, BSc, BEd, PhD, FIBiol, *Vice President*
Dame Anne McLaren, BA, DPhil, FRS (from 15.10.92)
The Rt Hon The Lord Marsh Kt (to 13.1.93)
N S E Martin, FBIM, FIIM (to 2.11.92)
M A Moore
Professor M Peaker, DSc, PhD, FIBiol, FLS, FRSE, *Vice President*
Mr C J Perrin MA (to 15.10.92)
M Rowson, MA (from 15.10.92)
The Hon Peregrine Simon, QC (from 10.2.93)
N D W Sitwell
A J F Smith, MA
C H Tudge, MA
D Tunnicliffe, BSc, FINSTT (from 15.10.92)
The Hon Sir Ronald Waterhouse, LLD, *Vice President* (to 2.11.92)
I Webb, BSc(Econ), MBA (from 2.11.92)
Councillor D P Weeks, BA (*Nominated Member*)
R J Wheater, OBE, FIBiol, FRSA, FRSE (to 2.11.92)

HONORARY FELLOWS

DATE OF ELECTION	
1977	HRH The Prince Philip, Duke of Edinburgh, KC, KT
1991	HM The Emperor Akihito of Japan
1952	Professor Sven Otto Hörstadius Zoologiska Institutionen, Uppsala, Sweden
1974	Dr Roger Tory Peterson Route 4, Box 131, Neck Road, Old Lyme, Connecticut, USA
1975	Professor Jean Anthony Muséum National d'Histoire Naturelle, 55 rue de Buffon, Paris 53, France
1975	Professor L D Brogersma Rijksmuseum van Natuurlijke Historie, Leiden, Holland
1975	Professor Jean Dorst Muséum National d'Histoire Naturelle (Mammifères et Oiseaux), 55 rue de Buffon, Paris 53, France
1978	Professor José C M Carvalho Museu Nacional, Quinta da Boa Vista, Rio de Janeiro, Brazil 20940
1984	Professor Ernst Mayr Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA
†1984	Professor Lord Zuckerman, OM, KCB, FRS University of East Anglia, Earlham Hall, Norwich
1988	Professor Milton Thiago de Mello SHIN QL 4, Conj.2, Casa 19 Lago Norte 71510-225 Brasilia, DF, Brazil
1990	Professor Knut Schmidt-Nielsen Department of Zoology, Duke University, Durham, NC 27706, USA
1990	Professor John Z Young Emeritus Professor of Anatomy, University College London, Gower Street, London WC1
1992	Professor Edward O Wilson Museum of Comparative Zoology, Harvard University, 26 Oxford Street, Cambridge, MA 02138-2902, USA

†Council learned with regret of the death of Lord Zuckerman on 1st April 1993.

MESSAGE FROM THE PRESIDENT
FIELD MARSHAL SIR JOHN CHAPPLE

I think that everyone connected with the Society will recognise that the past year has been a particularly momentous one, with a number of difficulties which have had to be resolved.

As a result of the work done last year by Sir Ronald Waterhouse's working group on the Charter and Byelaws, we have proceeded to redraft these documents along the lines which met with the Society's general endorsement at the last AGM. This working group is now being chaired by the Hon Peregrine Simon QC and, in brief, it is hoped that the revised Royal Charter might be in place by Spring 1994. I am very grateful to all those members of Council and our staff for the great amount of work that they have done to take these detailed matters forward. Reports on progress have been included in the Fellows' newsletters and an up-to-date statement will be made at the AGM.

After the result of the ballot last September, nearly all members of Council offered to stand down when suitable replacements had been found. This process was conducted under the existing constitution, and by early this year 9 casual vacancies to Council had been made and a new Honorary Secretary and Honorary Treasurer had been appointed. Together with the routine retirements of Council members as reported separately, there will be a substantially new Council in place for confirmation at the AGM. The procedure adopted this year for calling for nominations, and then voting on these by the Fellowship, is the first step towards the new procedures which are intended to apply in future.

The budgets for all operating Divisions of the Society have been subjected to very tight scrutiny. The economic climate is none too favourable but great efforts have been taken by all concerned to control costs and increase revenue. This has not been done without sacrifice and I would like to pay tribute to the commitment and dedication of all those who work for the Society in facing these difficulties with such determination.

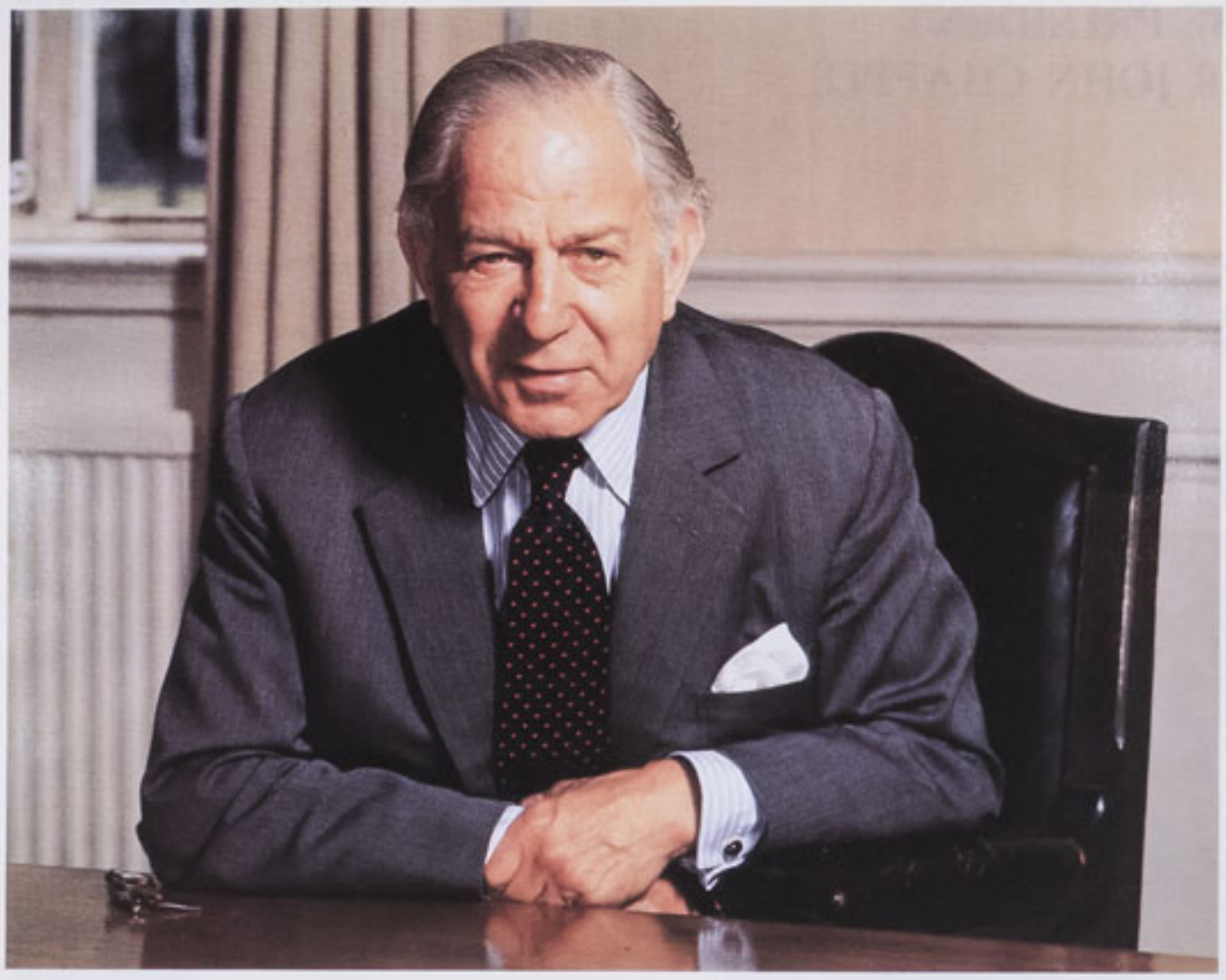
The way in which costs have been contained at Whipsnade has been truly remarkable, likewise at London Zoo severe cost cutting measures have been taken. These savings have been achieved without affecting the visitor experience. In addition at London, a new strategic plan has been agreed and announced. This has won the approval of Government in terms of its realism and targets.

The discussions for a renewal of the lease for the Regent's Park site are well underway. We are also in close touch with the Royal Parks Review body.

Finally, this Report records with great sadness the passing of Lord Zuckerman. Sir Ronald Waterhouse has written elsewhere in this Report on his services to the Society. He was associated with the Society through more than a third of our history. His contribution will surely last equally long in the future.

John Chapple

PRESIDENT



(photo: Bern Schwartz)

PROFESSOR LORD ZUCKERMAN OM, KCB, DSc, FIBiol, FRS

(Reprinted from the Annual Report 1984)

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

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

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

resources, and succeeded in raising many millions of pounds towards the cost of the programme. He also secured financial support for the capital programme from HM Government and the LCC, in 1964, and again from the Government in 1970. During the period of this reconstruction and regeneration, Lord Zuckerman won the respect, confidence and affection of the staff.

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

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

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

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

ERWEN OWEN
Past Director of Administration

LORD ZUCKERMAN: AN APPRECIATION

There must be many who wondered how and why a professor of anatomy became Chief Scientific Adviser to HM Government and served so long in that capacity but their puzzlement would have survived only briefly if they had had the good fortune to meet Lord Zuckerman. Without any conscious effort on his part, he dominated any company of which he was a member by his clear-sightedness and the force of his intellect, which was softened always by his considerable charm. He was a man with a rigorous, innovative mind who was able to look at problems in any field freshly and analytically, uninfluenced by received opinion, and who was always fearless in expressing his views once he had made up his mind.

I met Lord Zuckerman first in 1970 when, as Chief Scientific Adviser, he became a member of the Committee of Inquiry into Babies and I was very fortunate to enjoy his friendship for the last quarter of his life. In 1970 he was about to retire, nominally, from his government appointment but he was still at the height of his powers and, although the committee included several other very distinguished scientists, our discussions always took on a larger dimension when Lord Zuckerman was present. It was then also that I became aware of yet another of his manifold talents as he supervised the drafting of our reports at every stage.

A brief picture of Sir Solly Zuckerman, as he then was in 1970, shortly before he received the Society's Gold Medal, may help to give some indication of the range and scale of his activities. At the Zoological Society he was, of course, supreme by virtue of

his long and imaginative service, which Eirwen Owen, for many years the much admired administrator of the Society, outlined in her tribute to him in the annual report on his retirement as President in 1984. By 1970 his association with the Society had already lasted over 40 years and one of its first fruits had been his highly successful first book, *The Social Life of Monkeys and Apes* (1934), in which he described himself as anatomist to the Society. The 1960's had seen the accomplishment of most of the comprehensive building programme conceived by Solly as Secretary and implemented with the aid of large donations from private sources as well as with some government assistance, all secured for the Society by his irresistible combination of persuasion and charm. But he did not see his work as completed and he never regarded himself as a zoo or menagerie entrepreneur. His major allegiance was to the Learned Society itself and he devoted himself to fostering its scientific work and prestige as well as its financial well-being for more than another decade: he was still in almost daily attendance at Regent's Park, despite his other commitments, and he knew personally virtually every employee of the Society.

At his other London base, in the Cabinet Office, Solly remained a highly influential figure when Edward Heath took over from Harold Wilson as prime minister. His attempts to retire were politely ignored at first and, even when they were formally successful on his elevation to the House of Lords in 1971, he continued to advise successive governments from within the Cabinet Office until long after Mrs Thatcher had become premier. When I first knew him he was still sitting on innumerable commissions and committees and flying here and there for international consultations but he always found time to read the relevant papers before a meeting and, more importantly, to think through an original contribution to what was being discussed. In the governmental sphere he will perhaps be remembered best for his radical views and advocacy on the subject of international arms control but it should not be forgotten that his two other major preoccupations as scientific adviser were with industrial research and development and the protection of the environment, in both of which fields he played a pioneering role. The establishment by the Government in 1992 of an annual science and technology lecture in his name was a fitting tribute to the unique service that he had given over very many years.

Despite these demanding activities, which would have been more than enough for most exceptional men, Lord Zuckerman found the time to pursue his own academic interests and he was still producing new books, with more to come, when he died. This was achieved from his third base, at the University of East Anglia, in the founding of which he had played a leading part. It was he who wrote the blueprint for its school of environmental sciences and who obtained private funding for its international seminars on environmental problems; and for seven years he was its professor at large at a nominal salary. From there he continued to write important papers such as *Who speaks for Earth?* (1973) and *Population and the Quality of Life* (1974) and books such as *Nuclear Illusion and Reality* (1982) at a time when he was also preparing prestigious lectures such as the Compton lectures at the Massachusetts Institute of Technology in 1972 and the Romanes lecture at Oxford in 1975.

Inevitably this catalogue of activity does less than justice to the whole personality of its subject. It might suggest that Solly Zuckerman was a rather solemn man, unduly preoccupied with the cares of mankind, but he was far from that. I shall remember most of all the sparkle of his company, his generosity and his conviviality as a host. His countless friends ranged from the Gershwins, William Walton, Elisabeth Frink and Ben Nicholson to leaders and the less eminent in almost every other walk of life. For those of us who survive, his death has left a gaping void and it has deprived the Zoological Society of London of its greatest friend and servant. In saluting him now and thanking him, we send our deep sympathy to his wife, Lady Joan, who shared over 50 happy years with him and who gave him steadfast support throughout those years, whilst pursuing her own great talent as an artist.

SIR RONALD WATERHOUSE
(Vice President 1991–1992)
June 1993

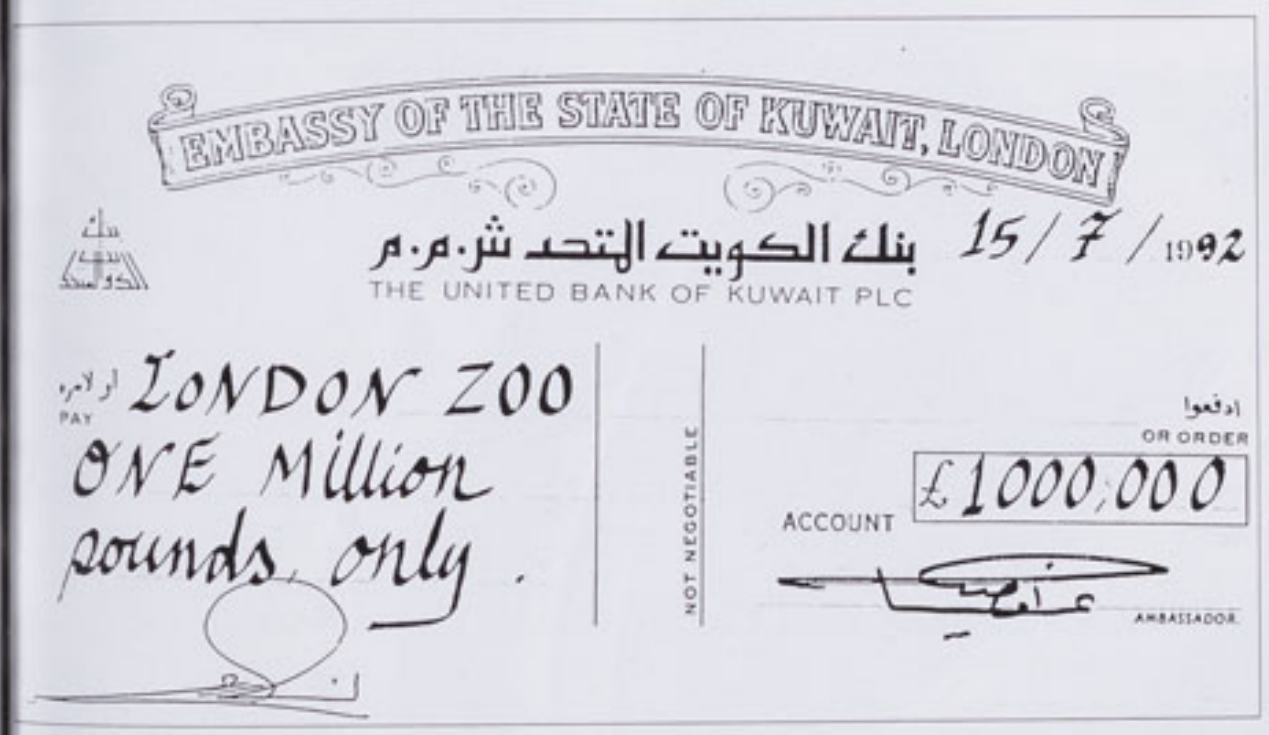
REVIEW OF THE YEAR

INTRODUCTION

Unprecedented media attention was focused on London Zoo as a result of the decision of Council on 16 June 1992 to close London Zoo at the end of the season.

Members of Council had become increasingly alarmed at the fall in visitor numbers to the Zoo and despite a rigorous cost cutting exercise they felt unable to maintain the *de facto* National Collection without the shortfall in revenue being met from elsewhere. They were also anxious not to deplete the representative nature of the Collection to such an extent that this reduced visitor numbers further, exacerbating an already grave situation. Neither were they prepared to continue incurring losses at London Zoo and in turn put at risk the Whipsnade estate, the Society's major freehold asset.

survival options for the Zoo. Accordingly, Professor Peter Jewell, who earlier in the year had melded the Society's own plans for the Zoo with those of a small group of Fellows, kindly agreed to chair a working party, known as the London Zoo Committee, to evaluate in all some eight proposals which had been received. The chair was later assumed by Mr Barrington-Johnson. The Committee's recommendation to follow the proposals set out in the Society's in-house plan, was accepted by Council 15 October 1992. The President had, however, announced in September that following the Emir's gift and an improvement in the financial position generally, the decision to close the Zoo had been suspended in the expectation that one of the options under evaluation would prove viable and sustainable.


EMBASSY OF THE STATE OF KUWAIT, LONDON

بنك الكويت التحد ش.م.م

THE UNITED BANK OF KUWAIT PLC

15 / 7 / 1992

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ACCOUNT

AMBASSADOR

It was therefore on a recommendation of the Management Committee that the decision was made to close the Zoo on 30 September 1992.

The response from the media was predictable. The majority of comment lamented the planned passing of such a revered institution. Many of the more informed articles highlighted the loss to conservation and the key role played by Zoo staff in participating in the captive breeding of endangered species.

There was no official appeal for funds. However the Emir of Kuwait donated to the Zoo £1M as a gift from the children of Kuwait to the children of London. Council debated the impact of this generous gesture and concluded, on 6 July, that whilst on its own the gift did not change the underlying financial difficulties which led to the closure decision, it did place moral pressure on the Society to look further at London Zoo had been saved. The door was also left open for joint venture schemes. Discussion with New Zoo Developments Limited (NZD), a company chaired by Mr David Laing, to build and operate an aquarium and a large format film theatre continued throughout the second half of the year. On 7 April 1993, Council decided to terminate further discussion with NZD because the perceived financial benefit was inadequate.

Meanwhile, a small group of Zoo staff had formed the London Zoo Survival Group whose aim was to keep the Zoo open. A like-minded group of Fellows sought to have the closure decision rescinded.

Council called a Special General Meeting on 13 July 1992 to explain to Fellows the circumstances surrounding the closure decision. 212 Fellows attended.

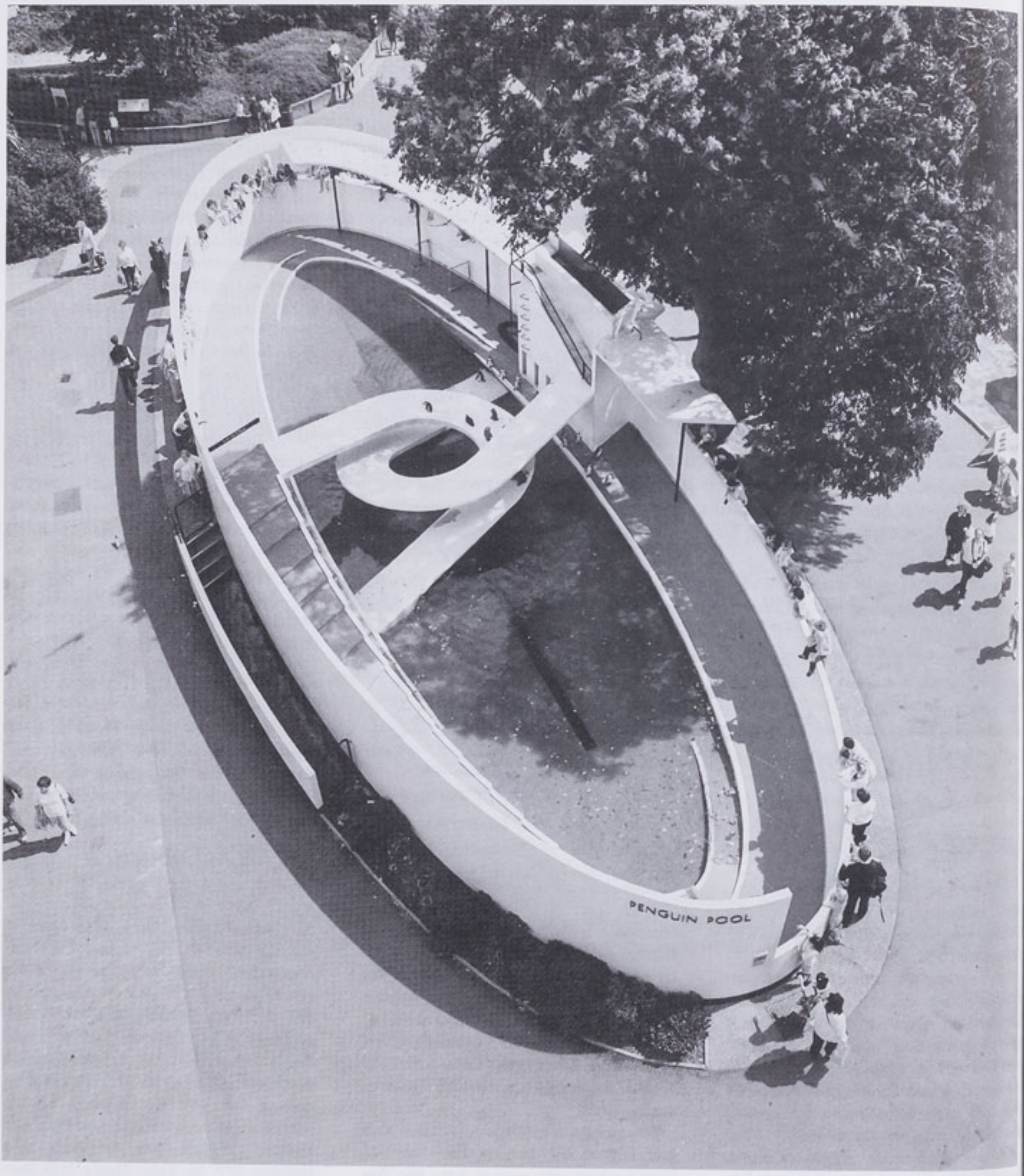
A further meeting, called in response to a requisition from sixty-nine Fellows, was held on 29 July to address two resolutions. The first, calling for the resignations of the officers, Council members and senior staff who had been responsible for the management of the Society's affairs which led to the closure decision, was carried by 184 votes to 32 with 9 abstentions. A second resolution, calling for London Zoo to be kept open as a national animal conservation centre, was carried 157 votes to nil with 7 abstentions.

As a result of the adverse voting, Council resolved to seek a vote of confidence by holding a postal ballot of all the Fellows. The result was declared on 14 September 1992. On a 55% poll, 441 (39%) voted in favour of the motion, 640 (56%) against. 5% of the votes were invalid.

Council met on 23 September to consider its position. The majority of those members who had voted to close the Zoo declared their intention to stand down. This was announced to the Society at the Annual General Meeting on 30 September 1992. On legal advice and in order to maintain continuity, a programme of gradual replacement was adopted. The Secretary, Sir Barry Cross and The Treasurer, Mr Peter Holwell, stood down on 9 December 1992, to be replaced by Professor R McNeill Alexander and Mr Peter Wrangham. The new Council, with nine new members, was finally in place by February 1993.

COUNCIL AND COMMITTEES

Council met on 15 occasions. The average attendance was 64%. Individual attendance was as follows:- Sir John Chapple 14 out of a possible 15; Professor R McNeill Alexander 3/3; Sir Barry Cross 10/12; Mr Peter Holwell 8/12; Mr Peter Wrangham 3/3; Mr John Barrington-Johnson 8/8; Professor Patrick Bateson 1/8; Professor David Bellamy 2/5; Dr Michael Brambell 4/4; Dr Stephen Cobb 5/6; Mr Geoffrey Cutting 4/4; Mr John Edwards 15/15; Professor Anthony Farmer 4/4; Professor Richard Gardner 3/8; Professor Tim Halliday 5/7; Mr Peter Hardy 2/5; Professor Mike Hassell 6/15; Professor Peter Jewell 9/11; Professor John Krebs 1/8; Professor Arthur Lucas 7/15; Sir William McAlpine 5/8; Dr Anne McLaren 5/6; Lord Marsh 7/12; Mr Nigel Martin 10/11; Mr Michael Moore 6/7; Professor Malcolm Peaker 7/7; Mr Charles Perrin 7/9; Mr Martin Rowson 6/6; The Hon



A comprehensive photographic survey of both London and Whipsnade was undertaken by Panabode Ltd. The Penguin Pool, perhaps the most famous of all the Zoo's buildings, is seen from a camera mounted on a 100' mast. (photo: Panabode Ltd)

Peregrine Simon 1/1; Mr Nigel Sitwell 4/7; Mr Anthony Smith 3/15; Mr Colin Tudge 7/7; Mr Denis Tunnicliffe 4/6; Sir Ronald Waterhouse 4/11; Mr Ian Webb 4/4; Councillor David Weeks 3/15; Mr Roger Wheater 4/11; Professor Arie Zuckerman 2/8. It is worth recording that in his three year's service on Council, Mr Barrington-Johnson never missed a single meeting.

The Management Committee was wound up in October 1992. In its place a series of supervisory committees was set up, each dedicated to one of the operating divisions of the Society: London Zoo, Whipsnade, and Conservation and Consultancy. The Institute of Zoology Committee, whose terms of reference were agreed in a Financial Memorandum between the Society and the University of London in 1988, remained unaffected. Council took direct responsibility for the Learned Society. The new committees, whilst retaining their status within the Constitution, were retitled 'Boards' to reflect their business orientated approach to the tasks. Zoo Operations Limited ceased trading on 30 September 1992, the management responsibilities for the two zoos reverting directly to the Society.

The London Zoo Committee was chaired initially by Professor Peter Jewell but pressure of work obliged him to hand over to Mr Barrington-Johnson. Following the Annual General Meeting, the London Zoo Committee was reconstituted as the London Zoo Board with Professor Malcolm Peaker becoming chairman. He was joined by Mr John Edwards, Professor Mike Hassell and Mr Colin Tudge. The Whipsnade Board, under the chairmanship of Mr John Knowles comprised Mr Christopher Marler and Mr Nigel Martin, they were joined later by Professor Tim Halliday, Professor Arthur Lucas and Mr Ian Webb. Professor Halliday also serves on the Conservation and Consultancy Board as chairman, other members being Dr Stephen Cobb, Professor Anthony Farmer and Dr David MacDonald. Professor Lucas, Principal of King's College, London, kindly agreed to chair the Education Committee in succession to Mr David Stanbury. Professor Vance Lanyon, Principal of the Royal Veterinary College, succeeded Professor Richard Gardner as chairman of the Institute of Zoology Committee.

The Constitution

Sir Ronald Waterhouse, a High Court Judge and a Vice President of the Society, chaired a working party on the Society's Charter and Byelaws. The resulting draft proposals were considered and approved at the Annual General Meeting. The general principal underlying the change was to make the Council more accountable whilst removing the ambiguities in the existing Charter and Byelaws. Sir Ronald stood down in December, to be replaced by the Hon Peregrine Simon QC. Competitive tenders were invited from eight legal firms to undertake the drafting associated with the new constitution including the need to have the proposals approved by the Fellowship and, ultimately, the Privy Council.

The Government

Responsibility for the Society's Regent's Park site transferred to the new Department of National Heritage as successor to the Department of the Environment.

Meetings were held during the year with Ministers and with officials to keep them apprised of the Society's position. The Government asserts that the only relationship it has with the Society is of landlord and tenant, despite frequent attempts by the Society to point out its national significance.

However, following the shift in responsibility between the two Departments, a softening in the attitude of the Government towards the Society has been detected. No longer is there any mention of the Zoo leaving Regent's Park, although as yet there has been no tangible evidence as to how the Government may convert its affection for the Society into financial or similar support.

Towards the end of the year discussions commenced on the renewal of the lease, which expires in 1995, for all 36 acres of the Regent's Park site.

The Royal Parks Review and Local Amenity Groups

Dame Jennifer Jenkins, chairman of the Review Committee, visited the Zoo, as subsequently, did the rest of the Committee. The Director of London Zoo and the Clerk to the Council later gave evidence to the Committee, stressing the Society's desire to incorporate in its plans the views of local residents and to improve the aesthetic relationship between the Zoo grounds and Regent's Park. The Society became a corporate member of 'The Friends of Regent's Park'. The Meeting Rooms have on several occasions been put at the disposal of the Friends for informative talks and for their Annual General Meeting.

One aspect of their interest in the Zoo which is displayed by the specialist Amenity Groups, concerns its unique architecture. Conducted tours behind the scenes for students and enthusiasts have been held from time to time and in February 1993, the Royal Commission on the Historic Buildings of England published a comprehensive record of the Zoo's architecture in 'The Buildings of London Zoo'. Lord Snowdon kindly agreed to be photographed in the Snowdon Aviary to promote the book and the official launch was held later in the month in the Elephant House.

Lord Zuckerman

While this report was being compiled, the death was announced of Lord Zuckerman whose name had become synonymous with that of the Society. An appreciation of Lord Zuckerman is given at the beginning of this report.

Obituaries

The Council records with deep regret the deaths of Mr William H Chippendale, OBE, Corresponding Member; Dr D. W. Evans, Corresponding Member; Professor Dr Heine Hediger, Corresponding Member; Dr William Straus, Junior, Corresponding Member; Dr Maurice Burton, Scientific Fellow; Dr Vera Fretter, Scientific Fellow; Professor Richard Denison Purchon, Life Scientific Fellow; Dame Janet Vaughan, Scientific Fellow; Viscount Massereene and Ferrard, Ordinary Fellow.

THE MEMBERSHIP

At the end of the subscription year (31 December 1992) there were 2,106 Fellows and 2,215 Associates, including 88 Student Associates.

ANNUAL GENERAL MEETING

The Annual General Meeting was held on 30 September 1992 with the President, Field Marshal Sir John Chapple, in the Chair.

In accordance with Article 12 of the Charter Sir John Chapple (appointed in March 1992 as President to fill the casual vacancy created by the resignation of Professor N A Mitchison) retired from office. In accordance with Article 10 of the Charter and Byelaw 25, the following Fellows retired as Ordinary Members of the Council: Mr J Barrington-Johnson and The Hon Sir William McAlpine (Ordinary

Fellows); Professor P P G Bateson, Professor R L Gardner and Professor A J Zuckerman (Scientific Fellows).

In accordance with Articles 11 and 12 of the Charter and Byelaw 26 Sir John Chapple was elected as President and the following Fellows were elected Members of Council: Mr M Moore and Mr N Sitwell (Ordinary Fellows); Professor T R Halliday, Professor M Peaker and Mr C H Tudge (Scientific Fellows). The following Fellows, appointed to fill the casual vacancies created in July 1991 and March 1992, were also elected: Mr J C Edwards, The Rt Hon The Lord Marsh, Mr N S E Martin, Mr C J Perrin and Mr R J Wheater (Ordinary Fellows); Professor A M Lucas (Scientific Fellow).

The President presented the following awards made in 1991 for contributions to zoology:

The Prince Philip Prize (for an account of practical work involving some aspect of animal biology, by a pupil under 19 years old of a school in the United Kingdom) to *Miss Louise R Kilbee*, of Sir Roger Manwood's School, Sandwich, for her essay 'An investigation into equine helminthiasis', and to her Headmaster a certificate recording the award.

The Thomas Henry Huxley Award (for original work submitted as a doctoral thesis) to *Dr F D Reavey*, of the University of York, for his thesis 'The feeding ecology and behaviour of caterpillars'.

The Scientific Medal (for distinguished work in zoology by scientists under 40 years of age) to *Dr B J Finlay*, of the Institute of Freshwater Ecology at Ambleside, for research into the physiological ecology of protozoans and their bacterial symbionts. The President also announced the award of a second Scientific Medal for 1991, to *Dr A E Keymer* of the University of Oxford, for her broad-ranging work on the ecology, immunology and evolutionary biology of parasites.

The Zoological Society of London Frink Medal for British Zoologists (for significant and original contributions by professional zoologists to the development of zoology in its wider implications) to *Professor R A Hinde, CBE, FRS*, of the University of Cambridge, for his many outstanding contributions to the biological study of animal and human behaviour.

The Zoological Society of London Marsh Award for Conservation Biology (for contributions of fundamental science to the conservation of animal species and habitats), awarded to *Professor R M May, FRS*, of the University of Oxford, for his seminal studies in population biology and ecology, was presented by Mr Brian P Marsh on behalf of the Marsh Christian Trust, the donors of the award.

Mr Marsh also presented cheques donated by the Marsh Christian Trust to the Prince Philip Prize winner's school and to the recipient of the Thomas Henry Huxley Award.

The President announced that **The Silver Medal** (for contributions to the understanding and appreciation of zoology, including such activities as public education in natural history and wildlife conservation) had been awarded to *Dr Jane Goodall*, for her pioneering contributions and continuing efforts to achieve understanding of the biology, behaviour and conservation of the great apes and other primates; it would be presented at a later date.

Awards and Honours

Council announced the following awards made in 1992 for contributions to zoology (the terms of the awards are given above where the presentation of the previous year's awards is reported):

The Thomas Henry Huxley Award to *Dr Anita Malhotra* of the University of Aberdeen, for her thesis 'What causes geographic variation: a case study of *Anolis oculatus*'.

The Stamford Raffles Award (for distinguished work by an amateur zoologist) to *Dr J D Summers-Smith*, for world-renowned work on sparrows.

The Scientific Medal to *Dr N H Barton* of the University of Edinburgh, for contributions to quantitative population genetics.

The Society's Frink Medal for British Zoologists to *Professor Sir Brian Follett, FRS*, of the University of Bristol, for contributions to the understanding of photoperiodism.

The Society's Marsh Award for Conservation Biology to *Dr D A Ratcliffe*, for his work on bird conservation and for his role in the discovery of the effects of pesticides on wild populations.

Professor E O Wilson of Harvard University, eminent as an authority on the social behaviour of insects and a founder of the theory of island biogeography and the subdiscipline of sociobiology, was elected an Honorary Fellow.

At a meeting of Council on 9 December 1992 the President presented the Society's Medal to Dr H Edward Kennedy in recognition of his services to the Society and to science.

Dr Kennedy, President of BIOSIS (Biological Abstracts) in Philadelphia, was instrumental in negotiating the Zoological Record Agreement, signed in 1980, whereby BIOSIS and the Society undertook to co-operate in the publication of this unique bibliography. The Society wished to record its appreciation of the determination Dr Kennedy had shown in securing the continuation of *The Zoological Record*, a publication of inestimable value to zoologists worldwide.

Amendments to the Regulations

The Resolutions to increase the annual subscriptions for Fellows and Associates from 1 January 1993 were agreed at the Annual General Meeting of the Society held on 30 September 1992.

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

PERSONNEL

At 31 March 1993 there were 313 full-time, permanent staff employed by the Society.

It is a mark of the dedication and professionalism of the staff that even with the seemingly certain closure of London Zoo scheduled for the end of the season, the zoo continued to run as usual. Dr Jo Gipps, formerly Curator of London Zoo, was Acting Director during the difficult summer months. He introduced regular bulletins for staff to supplement the established communications systems such as Team Briefings and the Joint Consultative Committee. Dr Gipps was confirmed in post as Director in January.

David Jones was appointed Director of the Conservation and Consultancy Division which was established in May 1992 to further the Society's work overseas.

The Chief Executive at Whipsnade, Andrew Forbes, left the Society to further his career in the leisure industry and was replaced in January by Stuart Earley. The

year also saw the departure of Professor Tony Flint who had been Director of Science for five years. Dr Geoffrey Smith is currently Acting Director of Science.

Other changes at senior level included the appointment of Nick Lindsay as Curator and Frances Sutton as Development Manager at Whipsnade, Sharon Ament as Marketing Manager at London Zoo, Ann Sylph as Librarian, Peter Humphreys as the Society's Information Officer and Dr Andrew Loudon as Head of the Reproductive Biology Group in the Institute of Zoology.

Mrs Carol Boroughs, Head of Personnel, came second in the 'Personnel Manager of the Year' competition. She had been nominated by colleagues. This reflected her outstanding professionalism when dealing with the redundancy programme and closure threat.

Awards

In the examinations for the City and Guilds Certificate in Zoo Animal Management seven candidates were successful: Mr M R Brett, Ms A J Ferguson, Mr D B J Fisher, Mr M S Fitzpatrick, Ms J W Ossowski, Ms J Pardoe, Mr S Young.

Departures and Retirements

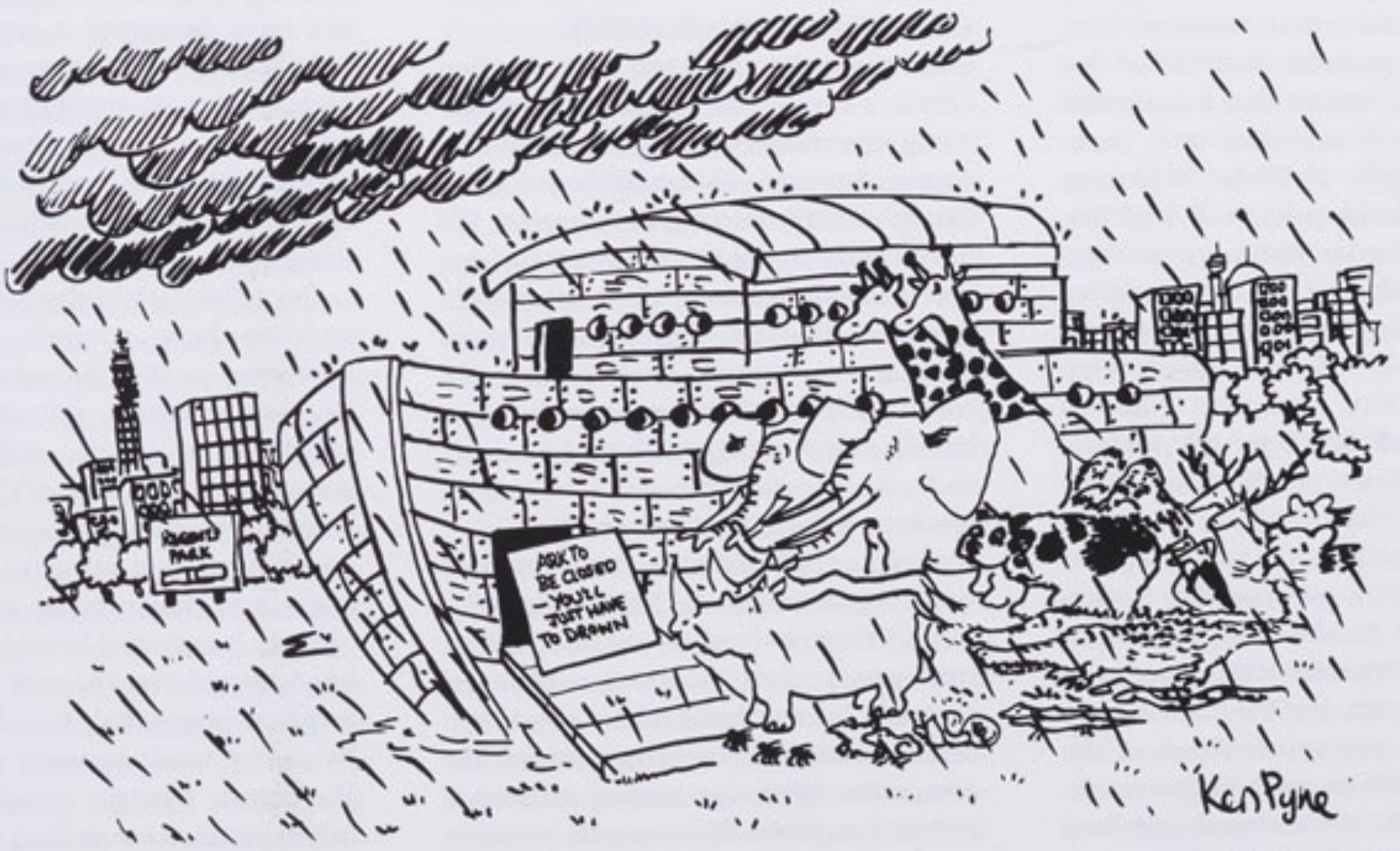
Mr P Turp, Senior Technician (17); Miss C Nutkins, Administrative Assistant (17); Dr H Moore, Head of Reproductive Biology Group (14); Mr R Fish, Librarian (33). Figures in brackets denote number of years of service.

Obituaries

We regret to record the deaths of the following pensioners: Mr W White; Mr L Coates; Mr H S Osborne; Mr E Tong; Mr A G C Broad; Mr L Powell. The death was announced, whilst in the United States, of Barkley Hastings, Supervisor of the Postgraduate Veterinary Training Course at Whipsnade.

ACKNOWLEDGEMENTS

Council wishes to record its appreciation of the work of those Fellows who serve on the advisory committees and boards, and of the continued support and help received from many individuals and organizations.



One of the many cartoons conveying the poignant message that conservation itself would be a victim should London Zoo close.

SCIENTIFIC ACTIVITIES

RESEARCH

THE INSTITUTE OF ZOOLOGY

Professor A P F Flint, who joined the Society's staff in September 1987, left at the end of February 1993 to take the Chair of Animal Physiology at the University of Nottingham. As Director of Science he established two new research groups (Conservation Genetics and Ecology). His successor is now being sought. When appointed he will, together with the Institute of Zoology Management Committee, determine the future scientific policy of the Institute in the face of current financial constraints.

ECOLOGY

The aims of this research group are (1) to study the behavioural, evolutionary and conservation ecology of animal populations in the wild and in captivity, and (2) to integrate theory and empirical data to improve our understanding of individual strategies and their demographic consequences.

Still only in its second year, the group continued to build on its initial foundation. All of the five projects described in last year's report (Cheetah and interspecific competition; kin selection and population demography of African Wild dogs; evolution of multi-queen ant societies; selection for disease resistance in Soay sheep; heritability of sexually selected traits) are now partly funded by external grants. These include four grants from the Royal Society, one from National Geographic and one from the Natural Environment Research Council Wildlife Disease Special Topic (collaborative with Zoology, Cambridge).

Our interest in selection for disease resistance and its demographic consequences was extended this year by a new project on the serology of rabies in domestic dogs and transmission of the disease to wildlife in northern Tanzania. Supported by the Agricultural and Food Research Council, through a Veterinary Research Fellowship, together with equipment and consumables from the Overseas Development Administration (ODA), this research includes the collection of blood and saliva samples from dogs living in settlements close to the Serengeti National Park, where precipitous declines in the numbers of Bat-eared foxes and of the endangered African Wild dog are thought to be due to rabies.

Another major new initiative this year concerns research on biodiversity and endemism. This work will assess (1) the extent and scale of endemic congruence across taxa, eg, by quantifying how far endemic bird areas predict centres of endemism in butterflies and flowering plants, (2) how the extent of endemism corresponds with other measures of biodiversity, including species richness, (3) how area-based assessment of conservation priorities overlaps with priorities derived from population biology and genetics, and (4) how the current distribution of conservation effort, driven by conservation of endangered 'flagship' species compares with the distribution of indices of biological diversity.

Recent advances in the theory of extinction times for species provided new routes towards an objective assessment of extinction risks in wild species, even when population data are limited. In collaboration with IUCN and CITES, members of the group have been working out new proposals for the definition and assessment of categories of threat.

CONSERVATION GENETICS

Over the past year, the Conservation Genetics Group has succeeded in developing expertise in new molecular genetic approaches and has established a foundation of extramural grant support. We have begun to publish the results of our newly established research programme in scientific journals. Our general goals remain to investigate evolutionary processes such as speciation, extinction, inbreeding and genetic drift and to apply molecular genetic techniques to important problems in biological conservation.

We have been fortunate to receive two sizeable grants from the Natural Environment Research Council (NERC), one to study genetic diversity among ecotone and centrally located birds of the Cameroon rainforest and the other to investigate the population differences among colonies of British Grey seals. This research promises to provide new insights into the factors that determine how genetic variation is structured in natural populations and involves the use of sophisticated new molecular techniques.

We have received two grants from the European Community. The largest, amounting to over a million ECUs, is a collaboration with four European groups and concerns the development and application of new molecular techniques to measure genetic variation in domestic and natural populations. The second EC grant is focused on an examination of genetic variability in the highly endangered Mediterranean Monk seal and aims to document the degree of genetic differentiation among the scattered extant populations. Other support has been obtained to study genetic diversity of bats (NERC), systematics of bustards (The Nature Conservation Bureau Ltd) and Scottish Wildcats (Scottish Natural Heritage) and reproductive success in baboons (The National Science Foundation, USA).

On a technical front, we have succeeded in identifying hypervariable nuclear loci in several animal species that can be used to dissect, on a finer geographic scale than ever before, the genetic structure and variability of closely related populations. We have submitted what may be the first report documenting variability in these hypervariable loci in two species of Hairy-nosed wombats. One of these species, the Northern Hairy-nosed wombat, is the most endangered mammal in Australia and our results have shown an alarming decrease in the level of genetic variability. We have developed a new expertise in DNA sequencing, a prerequisite for doing high resolution population and systematic studies and have recently sequenced regions from the rapidly evolving mitochondrial genome totalling over several thousand base pairs.

Our efforts are beginning to bear fruit and we have scientific articles soon appearing on DNA fingerprints in butterflies and baboons, mitochondrial DNA sequences of canids, and variation in colonizing populations of Gall wasps. The latter study summarizes several years' work on an intriguing invasion of Gall wasps from their native range in Hungary to western Europe and Britain. The invasion has occurred over the past 250 years and involved sequential founding of populations by small numbers of individuals. The genetic changes associated with this recent invasion are striking and promise to provide an important precedent for future theoretical and empirical studies. The next year promises to be extremely productive as many other new projects reach completion.

REPRODUCTIVE BIOLOGY

The aims of the Group are to advance knowledge of fundamental mechanisms in reproductive biology with the ultimate goals of: 1) Facilitating the development of

technology for the conservation of animal biodiversity both in captivity and in the wild and 2) Establishing how environmental change influences reproduction.

The Group has continued to build on its earlier scientific successes with the establishment of a number of new projects and the award of additional research grants. Funding for the Group includes a £1.5M Joint Research Council MRC/AFRC Programme Grant in Developmental and Reproductive Biology over five years, three additional substantial Project Grants from the AFRC, five Research Council PhD studentships and further project grant funds of over £1/4 million from the Wellcome, MAFF and MLC.

The Head of the Group, Dr Harry Moore, left in October to take up a Chair at the University of Sheffield and was replaced by Dr Andrew Loudon.

Physiological Ecology

Behavioural and physiological aspects of reproductive suppression were studied in the Naked Mole-rat. In socially suppressed, non-breeding males, spermatogenesis was impaired. During a field trip to southern Africa, studies on six species of African Mole-rat (one previously undescribed) yielded ecological data and samples for the investigation of mating systems and the relation between social group size and intra-group genetic variability.

Continuing studies of the interaction between hormones and seasonal photoperiodic change in controlling sexual behaviour in Red deer have important implications for captive breeding, because attempts to induce oestrous behaviour and mating in exotic species frequently fail. Further investigations included a study of the possible mechanisms underlying the skewing in sex ratio which occurs in wild Red deer and is correlated with social status. The time of ovulation after progesterone decline occurred later in yearling than adult animals and we are now investigating whether social rank influences the pattern of ovarian development and steroid hormone secretion during the oestrous cycle and in early pregnancy. Individual differences in steroid secretion pattern may account for a selective loss of embryos and skewing in birth sex ratio.

Techniques developed for the culture of whole hair follicles and follicular dermal papillary cells from Red deer will help to elucidate the role of hormones and local factors in the control of seasonal and sexual hair growth and also have broader implications for the regulation of annual cycles in mammals. The binding of androgens to cultured dermal papillary cells was related to mane growth in the male.

Studies on melatonin binding, photoperiodic history and prolactin secretion in female Bennett's wallabies, furthered our understanding of the ontogeny of seasonality and the role of prolactin in the control of reproduction in marsupials.

Studies on Syrian hamsters indicated that a single gene defect of the daily (circadian) biological clock has a widespread effect on a range of different time-keeping processes.

Endocrinology

Many pregnancies fail in very early gestation. In ruminants, a key event in the establishment of pregnancy is the production by the developing conceptus of chemical signals which influence the mother's hormonal state. Our work has emphasised the importance of uterine hormone receptors, and their effects on the actions of uterine hormones. In ruminants, the oxytocin receptor (OTR) holds the key to the establishment of pregnancy, its activity in the uterus being controlled by embryonic interferon.

Studies of the maternal recognition of pregnancy in sheep demonstrated a key role for the oxytocin receptor. The sheep OTR was cloned and the message was localised to the luminal epithelium of the endometrium. Trophoblast interferon exerted its antiluteolytic action by inhibiting expression of the OTR and this effect was demonstrated to be due to protein kinase C.

In collaborative studies, the prolactin receptor cDNA from Red deer was cloned. Briefly, this was accomplished by means of rat primers, designed from conserved regions within the prolactin receptor cDNA, in polymerase chain reactions (PCR) with Red deer liver cDNA. The isolated PCR product was then used to probe a cDNA library prepared from Red deer liver tissue and two clones were isolated (0.8 and 4.0 kb). These clones are now being sequenced and initial results suggest that the 4.0 kb clone encodes the full prolactin receptor message. Future work will investigate the seasonal expression of the receptor gene and hence improve our understanding of the regulation of annual cycles in mammals.

Research on artificial insemination (AI), embryo transfer and *in-vitro* fertilization continued in relation to conservation breeding programmes.

We investigated possible genotypic effects on conception rate of European Fallow deer after oestrous synchronisation and AI with European or Mesopotamian Fallow deer spermatozoa. Genotype had no effect on conception rate, differences being mainly due to differences in the freezing capacity of the spermatozoa of the two subspecies. We also investigated embryo transfer in Fallow deer. After superovulation, a high proportion of embryos (46%) were recovered and transferred, with an overall conception rate of 55%. Current studies on oocyte collection from superovulated females will be invaluable in future breeding management of rare captive ungulates.

In a study of ovarian function and the maintenance of pregnancy in primates we identified the presence of a luteolytic agent (prostaglandin $F_{2\alpha}$) which was found to require cell contact to exert its action. The time course of luteolysis may depend upon changing responsiveness of second messengers such as protein kinase C to the action of prostaglandin.

The protein hormone inhibin, which is produced by the marmoset corpus luteum, may play a role in the establishment of pregnancy and act as an early pregnancy marker. We demonstrated differential control of inhibin and progesterone production by marmoset luteal cells in response to chorionic gonadotrophin (CG) and $PGF_{2\alpha}$ produced by the embryo.

Gamete Biology and Early Embryonic Development

A human gene, the homologue of which was identified as being expressed early in rat spermatogenesis, was sequenced and shown to code for a transcription factor. Its precise role in testicular function is yet to be established. The serine-protease inhibitor molecule implicated in mammalian sperm-egg binding was localised to a precise region of the spermatozoon, suggesting a role in regulating the acrosome reaction, important in fertilization. Culture of epididymal segments from a marsupial, the Grey Short-tailed opossum, demonstrated synthesis and secretion of different proteins down the length of the duct. In eutherian mammals this is related to sperm maturation. The research programme aims to elucidate fundamental mechanisms relating to fertilization but may also reveal the extent to which

heterogeneity in spermatozoan populations plays a role in sperm selection and sperm competition in mammals.

Work related to the role of the maternal and paternal genome in development showed that unfertilised marmoset oocytes could be stimulated to divide by ethanol exposure or electrical stimulation. Ethanol-activated parthenogenetic embryos developed to 16 cells *in vitro*, but electrically-activated haploid embryos developed to only four cells. It was possible to perform pronuclear transfer by micromanipulation of one-cell marmoset embryos. After such transfer, control embryos (both parental genomes restored) developed to eight cells *in vitro*. It was possible to create uniparental marmoset embryos, which developed to at least six cells *in vitro*. The research provides fundamental information which will be of value in future embryo transfer programmes in primates.

Cryomicroscopy and fluorescence microscopy was used to measure the permeability (damage) of the sperm plasma membrane during cryopreservation. Increased permeability was induced by freezing *per se* and by the hyperosmotic environments induced by the crystallisation of water from solution. Computer-assisted sperm motility assessment was used in an effort to relate sperm quality to fertility. Two major fertility trials in domestic pigs gave encouraging results. Broader applications from this work include an improvement in understanding of the preservation of semen from non-domesticated and endangered species.

COMPARATIVE MEDICINE

Applied Immunology

The research has been concentrated on parasitic organisms and the diseases they cause in man and animals. The successful development of immuno-tests for malaria parasites and their antigens was followed up by field trials in Columbia (S. America), Africa and Asia. A simple colour test for the diagnosis of human and canine leishmaniasis (a deforming disease) was tried out in the Sudan, Pakistan and Somalia. Similar colour tests to identify the insect vectors of disease by determining the animal species from which ingested blood was derived have been used in Nigeria, Ghana, Zimbabwe and other tropical locations.

Microbiology

Necrobacillosis, a potentially fatal disease of many species, including macropods, deer and antelopes, is caused by *Fusobacterium necrophorum* (FN), an anaerobic bacterium inhabiting the alimentary tract of normal animals. Infection of the body surface results from the contamination of small wounds with faeces containing FN and earlier work showed that fusobacterial infectivity was greatly enhanced by the normal faecal microflora. It has recently become clear that FN is commonly present in the rumen of cattle and in the sacculated (rumen-like) portion of the wallaby stomach but, surprisingly, is excreted in the faeces of only a small proportion of cattle, wallabies and deer. Accumulating evidence suggests that digestive disturbance, which interferes with the normal intestinal microflora, leads to intestinal multiplication and faecal excretion of FN, thereby providing a source of infection. This suggestion, if confirmed, will assist in the managemental control of necrobacillosis, a disease for which there is no effective vaccine because the main virulence factors of the causative organism are only weakly immunogenic.

Examination of human FN strains showed that the term 'necrobacillosis' as used in human and veterinary medicine refers to diseases that differ in important respects. Unlike pathogenic animal strains, all human strains examined except one were insusceptible to infectivity enhancement by *Staphylococcus aureus*. The exceptional strain, although susceptible to infectivity enhancement, differed from animal strains in its clinical and pathological effects.

Type C botulism is a common cause of mortality in gulls in the UK. A survey of 19 landfills showed that $>60\%$ were contaminated with *Clostridium botulinum* type C (and D) spores. This high degree of contamination was not reflected in refuse before dumping. The frequent presence of type D was surprising and inexplicable. Type A, which though very rare in the British environment caused a dramatic outbreak of human botulism in 1922 (the 'Loch Maree disaster'), was found in the intestine of a gull.

VETERINARY SCIENCE

Diseases of Zoo Animals

The clinical cases treated during the year at Regent's Park and Whipsnade were, as ever, diverse and varied. The female Giant panda 'Ming Ming' spent several weeks at the Animal Hospital undergoing intensive treatment of bite wounds inflicted by 'Bao Bao' at their first introduction. A young Musk ox with a fractured metacarpal (front leg) was successfully treated at Whipsnade. Colleagues from the Royal Veterinary College assisted in the investigation of several cases, including two Cheetahs with a malabsorption syndrome.

Studies of spongiform encephalopathy in zoo animals are continuing. Six of the Society's Greater kudu have died with this disease. These include five out of the eight born at Regent's Park since 1987. The pattern of incidence suggests that the kudu are very susceptible and also that, in contrast to BSE in cattle, transmission occurs between individuals.

Toxoplasmosis was diagnosed as a cause of death in several free-ranging Red-necked wallabies at Whipsnade and serological surveys indicated that exposure to this protozoal infection is relatively common. Further investigations of this disease are planned.

Wildlife Diseases

It has been suggested that hyperplasia (abnormal growth) of the cortex of the adrenal glands in some marine mammals may be associated with accumulation of chlorinated hydrocarbons in these animals. A study of adrenal cortical volume in relation to blubber chlorinated hydrocarbon concentrations was carried out as part of the Marine Mammal project in 28 Harbour porpoise carcases. The preliminary results suggest that there was no significant correlation.

In recent years there has been an increase in the number of reports of mass mortality incidents in common frogs. A project was initiated to study these. In many cases severe skin ulceration was observed and the causes of these and other lesions are under investigation.

SCIENTIFIC MEETINGS, SYMPOSIA AND SEMINARS

The year's programme of Scientific Meetings aimed, as always, to cover a wide diversity of topics. Eight meetings were held: 'Predator-prey interactions in Antarctica' in April, 'Oil pollution in the Gulf: has fact matched prediction' in May and 'Conserving butterflies' in June. The next session opened with 'Canids: origins, relationships, ecology and behaviour', and continued with 'Cnidarian symbiosis', 'Parrot conservation', 'Hot & cold running water: the biology of power station cooling waters' and 'Survival strategies of migrating birds'.

The Society is extremely grateful to all the speakers and chairmen who took part in the programme. Meetings continued to include a short contribution from members of the Institute of Zoology on current research projects, though the customary reports on the animal collections were presented only occasionally.

Two Symposia were held during the year. The first was 'Recent advances in marine mammal science', held in April and organized by Dr I L Boyd of the British Antarctic Survey. The second, held in September and organized by Dr R C Tinsley of Queen Mary & Westfield College, was on 'The biology of *Xenopus*'. The Society warmly thanks the organizers, who also edit the proceedings of the meetings, and all the speakers from both the UK and overseas who took part, in many cases providing their own travel funds. Thanks are also due to the organizations who provided grants to help defray the costs: the Royal Society, who supported both meetings; Merck Sharp & Dohme Research Laboratories and Singer Instruments, who supported the *Xenopus* meeting.

PUBLICATIONS

Journal of Zoology

During the year, twelve parts of the *Journal of Zoology* were published—from Volume 226 Part 4 to Volume 229 Part 3—containing a total of 167 papers. These spanned, as always, an immense range of animal groups and biological disciplines. 'One of the strengths of the *Journal of Zoology*,' remarked a reader, 'is its variety' and his views, expressed by many others, reflect the importance of a general zoological journal in promoting the interaction of knowledge and exemplifying biodiversity in publication.

The number of papers submitted from all over the world continues to be high, nearly 300 this year, and entails a rejection rate currently approaching 50%. The burden of assessment and selection falls on the many referees who generously assist the Society, and on the Publications Committee. The Editor and Council are deeply grateful to them all for their invaluable work.

The *Journal* continues to contribute significantly to the Society's income. The extent to which it does so is not always apparent from the Annual Accounts, where its profitability has often been obscured by expenditure set against it which relates to other Society activities undertaken by the Publications Department.

Symposia

Volume No. 64 in the Series *Symposia of the Zoological Society of London* was published during the year by Oxford University Press: this was 'Biotechnology and the conservation of genetic diversity', edited by H D M Moore, W V Holt and G M Mace of the Institute of Zoology. Sales of the series, from which the Society receives royalties, continue at a steady level and provide a source of income which enables the Society to hold the international meetings which these volumes record.

Academic Press, formerly joint publishers with the Society of the *Symposia* series, decided in 1992 to discontinue selling backstock. The Society has a small supply of most of these volumes (Nos 1–52, published in the years 1960 to 1984), which will be sold at reduced prices.

Zoological Record

Indexing for Volume 128 was completed at the end of June 1992 with 67,895 items indexed, resulting in 77,175 citations in the final volume. These items were obtained by scanning 6,937 serials and 1,731 books.

Indexing for Volume 129 is on schedule for completion at the end of June.

Towards the end of 1992 it became necessary to make most of the Data Entry staff in York redundant in order to ensure that BIOSIS UK financial targets in 1993 could be met. As a direct result all indexing in York was transferred to the existing data entry system; those indexers based at the British Museum (Natural History) continue to prepare mss for data entry in York until the new PC-based system becomes available in 1993.

The amount of material available for indexing increased during the year, reversing the trend in the last two or three years. No clear reasons for this fluctuation have been established, although it would appear that there may have been a roughly five-year cycle over much of the history of *Zoological Record* since 1864.

The potential availability in the longer term of material scanned for the *Record*, began to be a matter for concern. The British Library Document Supply Centre whose holdings form the major source at present, along with many other libraries has been forced by economic conditions to make significant reductions in its stock in the last few years, which is now beginning to affect the serials covered by the *Record*.

The new production system being developed for *Zoological Record* is on schedule. The main system in York will be linked to a smaller network for BIOSIS UK staff at the British Museum (Natural History), and also to another new system being developed by BIOSIS in Philadelphia for *Biological Abstracts*. Considerable time has been spent working towards compatibility between the UK and US systems, although initially this will be limited to the bibliographic elements of serial publications.

BIOSIS staff in York and Philadelphia have collaborated in the development of a CD-ROM version of *Zoological Record* to be released in late 1993. The first edition will include all volumes from 115 to 129, and will then be updated at six-monthly intervals. Significant effort has been put into the preparation of a new Subject Thesaurus, combining and consolidating the different indexing vocabularies which have been used over the last twelve years, which it is hoped will assist non-specialist users.

BIOSIS UK staff are now responsible for the running of all training courses for all BIOSIS products, including *Zoological Record*, in the UK, and for the operation of the European Help Desk which provides support for those products throughout Europe.

BIOSIS UK and the Zoological Society continued their collaboration with the International Commission on Zoological Nomenclature, under the auspices of IUBS, to develop a *List of Available Generic Names in Zoology*.

Thanks are again due to the Director General for Science, Technology and Industry at the British Library Document Supply Centre, Boston Spa, and to the Director of the British Museum (Natural History) for accommodation and support given to the staff of the *Zoological Record*.

International Zoo Yearbook

Volume 31 of the *International Zoo Yearbook* was published in December 1992. The 22 papers in Section 1, 'Australasian fauna', commissioned with the help of John DeJose, director of Perth Zoo, provide a good overview of the work of Australian and New Zealand zoos in helping to conserve the region's unique fauna. The 23 papers in 'New developments in the zoo world', range from a study on Arctic fish and invertebrates to the maintenance of the Arabian Tahr in Oman, and include a useful selection of papers on the primates.

with particular emphasis on the gorilla. The data on breeding of vertebrates in zoos cover 1990 and the census of rare animals in captivity was taken at 1 January 1992. The special topic for Section 1 of Volume 31, currently in preparation, is 'Ungulates'. The section concentrates heavily on threatened ungulate species, with a number of papers on reintroduction and conservation *in situ*, as well as captive management and behavioural studies. Fourteen papers have been accepted for the section 'New developments in the zoo world'.

The reference section includes the biennial list of zoos and aquaria of the world, the list of vertebrates bred in 1991, the census of rare species in captivity at 1 January, 1992, which for the first time include some invertebrate species, and the summary of international studbooks and world registers.

The editor, P J S Olney, continues his work as co-ordinator of international studbooks. Over 120 species are now covered by the international studbooks which are an essential tool in managed-species programmes.

LIBRARY

Reg Fish, Librarian for the past 33 years retired in July 1992. He was replaced by Miss Ann Sylph as Librarian whilst Peter Humphreys was appointed to the new post of Information Officer with special responsibility for promoting the work of the Society and the archives. Use of the Library continued to increase with 'customers' drawn roughly half from the membership and half from staff of the Institute and the Zoo.

Library material relating to the current scientific meetings is displayed for a few days before and after each meeting. Newly acquired books are also displayed in the reading room and are listed in the Library's acquisitions list which is compiled monthly and circulated to staff. It is available to Fellows on payment of a small fee to cover postage. A Library Endowment Fund has been established formally by Council. The Fund has a target of £1 million to enable the Library to be funded from the interest received. The balance currently stands at about £124,000. Donations to this Fund would be most gratefully received and will help to preserve the unique collections in the Library. The Library has a minimal budget for book acquisitions and so relies heavily on the generosity of those who donate books. Donors this year include:- Dr E Barlow, Professor J L Cloudsley-Thompson, Mr J Edwards, Mr A Gommersall, Dr J Hemming, Mrs A Jepson, Mr B Jorgensen, Dr I F Keymer, Mr A V Kivenko, Mr Koide, Professor P A Racey, Mr A Seth-Smith, Dr J Slack, Mr H Swann, Miss A Waterfield, the estate of Mr P H Maxwell, Messrs Dorling-Kindersley and the Federation of Zoological Gardens of Great Britain & Ireland.

The Library Reading Room (photo: Doug McKenzie)

LONDON ZOO

Visitors during the year: 949,655

THE COLLECTION

The Animal Management department continued to be involved in the early part of the year with the reduction in the number of animals kept, as part of the cost-cutting exercise and of the evaluation of species in the Collection, taking into consideration those for which captive-breeding programmes are an integral part of their conservation, in line with the Mission Statement.

The reduction in species did however enable there to be an increase in enclosure size for a number of the remaining animals. Nearly all of the paddocks on the Cotton Terraces, and many of the aviaries, were doubled in size, and this may have been a factor in the Bird Department having one of its best breeding seasons in many years, the most notable hatching being from the endangered Manchurian Red-crowned crane. This was the first breeding of the species at London Zoo. Other notable hatchings in the Bird Department included Black-footed penguin, Turkmenian Eagle owl, Inca tern, Superb Glossy starling, Demoiselle crane, Boobook owl, Burrowing owl, Mikado pheasant, Hume's Bar-tailed pheasant, White-cheeked turaco, Livingstone's turaco, Harrier hawk, Scarlet ibis, Fairy lorikeet and Asian Pied starling.

The most notable and regretted mammal departures were of the Bornean Orang Utans. The debate about which of the Great Ape species should remain at the Zoo was highlighted in the BBC2 series 'The Ark', and the solitary social structure of the Orangs, compared with the social Chimpanzees, dictated that the Chimpanzees should stay. The departure of the Orangs has provided more space for both the Chimpanzees and the Gorillas.

The Asiatic lions 'Arfer' and 'Ruchi' produced two litters of cubs, but the first litter (of one cub) was premature, and the second litter was killed by the mother at two days old.

'Dilberta', 'Layang Layang' and 'Mya', the Asiatic elephants, continued to walk in the Zoo grounds, proving very popular with visitors. The fourth elephant 'Thi', who is on breeding loan to Chester Zoo, is expecting her first calf in September 1993. 'Dilberta', at 13 years of age London Zoo's oldest elephant, spent four weeks at Chester Zoo in the spring, during which time she mated with 'Chang', one of the two bull elephants at Chester. Unfortunately, she did not conceive, but the breeding programme will be continued along similar lines.

The Clore Pavilion maintained its popularity. The refurbished Moonlight World, where the endangered Rodriguez Fruit bats in the bat cave produced four surviving young, being a particular feature. On the Ground Floor, the female Saki monkey gave birth to her fifteenth baby, and two Prevost's squirrels were born, the first of this species in the Clore. The Common dormouse breeding project produced four surviving young. The Koala was moved to Lisbon Zoo, Portugal, and a pair of Binturongs are now in the Round House (formerly the Lubetkin Great Ape Breeding Colony).

Other notable mammal births included Chimpanzee, Lar gibbon, Red-faced Spider monkey, Sulawesi Crested macaque, Diana monkey, Yellow mongoose, Ocelot, Pudu, Giraffe and Arabian oryx.

The Children's Zoo was fully opened following its partial closure in the early part of the year, with two new Hereford calves in the cattle enclosure, and plans to return pigs to the section. The ponies continued to give rides to children during the summer months, and received a first-class commendation in the London Harness Horse Parade on Easter Monday.

Seahorse in the Aquarium

The Aquarium was presented with seven tons of coral which had been seized by H M Customs and Excise. It is hoped that most of this will be used in the new Aquarium development plan, but, in the meantime, a quantity of it was used to create a dry exhibit with accompanying text, to explain the problems caused by the destruction of coral reefs.

A group of Seahorses was kept off-exhibit for staff to investigate improved husbandry techniques, with a view to eventual captive-breeding. Seahorses are notoriously difficult to keep in captivity, yet are increasingly under pressure in the wild from the ornamental trade, and from the pet trade.

The Reptile House obtained a pair of Nile crocodiles from the Cotswold Wildlife Park early in the year, followed by another female in the autumn. They are housed in the large crocodile pond, and are the first specimens to be exhibited at the Zoo since 1978. A group of Standing's Day geckos was obtained and this Madagascan species is new to the Collection. In the spring, the old Beaver Pond in the Middle Gardens was converted to a Reptiliary. A number of lizard species were displayed during the summer months, and were very popular with visitors. Several exhibits in the Reptile House itself were renovated, including those for Taipan and Fer-de-Lance snakes, Shingleback Lizard and Prehensile-tailed skink. Staff painted sympathetic backdrops on to the walls of the enclosures, a feature which was prominent when the house was originally opened in 1927.

The Invertebrate department's development of a breeding programme, in association with English Nature, for the endangered British Field cricket culminated in the release of 700 Zoo-bred crickets into selected sites in West Sussex. Zoo Federation Meritorious Breeding Awards were won for conservation work. Staff also participated in an Institute of Zoology research project at Leiden University, investigating genetic drift in an African butterfly.

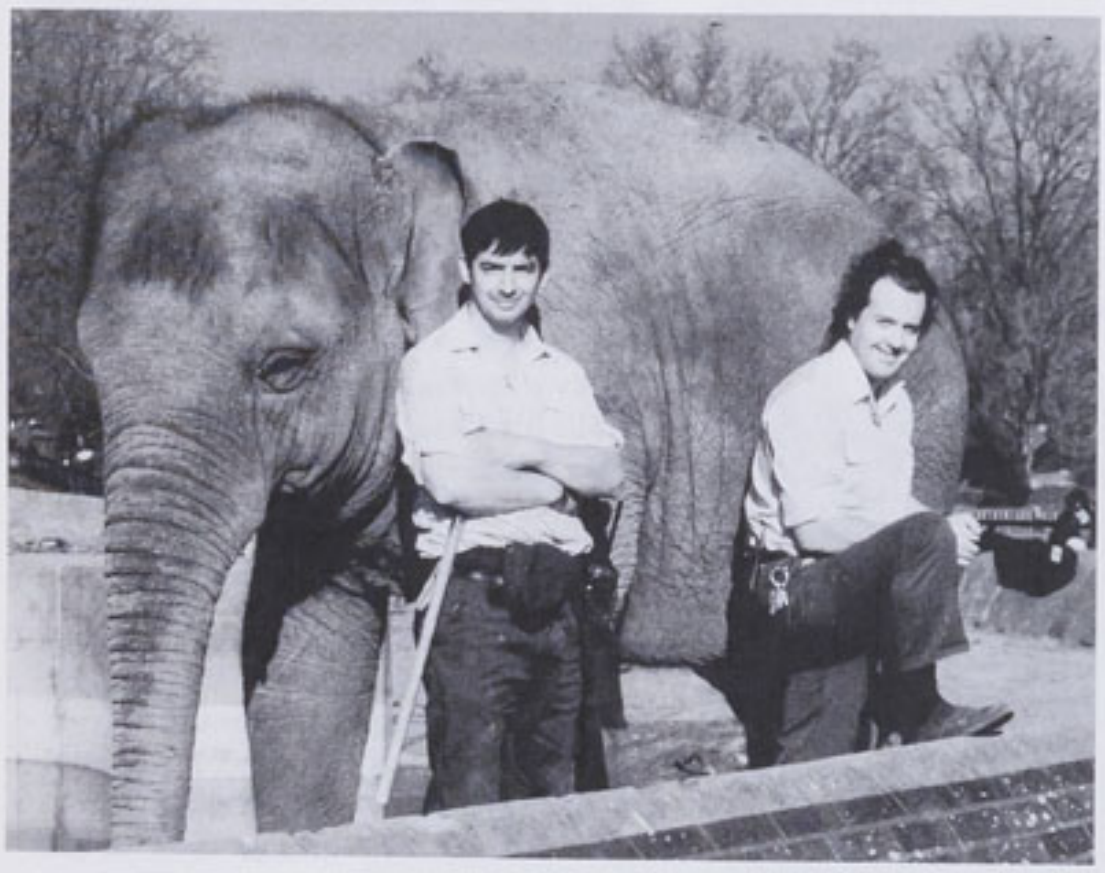
Seven publications were produced, including a set of symposia proceedings on Arachnids. Papers were given at a number of major conferences, including the Sixth World Conference on Breeding Endangered Species. A major technical report was produced for the Government of St Helena, and the Foreign Office, as part of the department's continuing conservation efforts for the Island.

GENERAL SERVICES DEPARTMENT

The department continued to build good relationships within its divisions removing many of the old demarcations.

Purchasing and Transport division was the recipient of two trucks on long term loan from Kawasaki UK. A relief vehicle was sent to Zagreb Zoo in Croatia, in collaboration with the GMB Union, with much-needed supplies of food, clothing and animal foodstuffs. A second trip is planned.

Clouded leopards



James Robson and John Stevens with 'Lyang Lyang' in the elephant paddock

Rhinoceros iguana in the Reptiliary

Lord Snowdon is seen looking at his personal Zoo scrapbook. Photographed within the Aviary which bears his name.

Lord Snowdon visited the Zoo in January to promote 'The Buildings of London Zoo', published by the Royal Commission on the Historic Monuments of England. (photo: RCHME)

Young White-faced Saki monkey

Members of the Royal Parks Review Committee inspecting the Mappin Terraces

Black-footed penguin

Paul Pearce-Kelly with a Mexican Red-kneed bird-eating spider, one of the species being bred at London Zoo

Manchurian Red-crowned crane bred for the first time at London Zoo

Binturong: one of the recently acquired pair

Projects involving Maintenance staff included the siting of a marble elephant donated by Liberty's, the Regent Street store, in the centre of Barclay Fountain; the upgrading of the small Penguin Pool; refurbishing the Gorilla and Chimpanzee exhibits, feeding stations in the Snowdon Aviary, the new Golden Lion tamarin exhibit in the Sobell Pavilions, new Nursing Mothers' Room in the Regent Café; and refurbishment of the Staff Car Park. Many of the projects were joint ventures with keeper staff and other departments. The Department was also responsible for overseeing the extensive clearing and levelling of the lower paddock walls of the Mappin Terraces, which was undertaken by the University of London Officers' Training Corps, as their Exercise 'Green Charity'.

areas. The old Squirrel enclosure was replanted to create a woodland effect, with rhododendrons, camelias, laurel and bulbs, including crocus, daffodils, bluebells and snowdrops. Twenty years' growth (40 cubic metres) of *Polygonum* was cleared from the Tiger enclosure. This was followed by trimming and removing ivy from all the big cat enclosures and Diving Birds Aviary.

An under-used area in the south-eastern corner of the Zoo was cleared for use as a site for composting leaf mould. Soil is also stored there for in-fill in other areas within the Zoo. The public were invited to bring their old Christmas trees to the Zoo for re-cycling. A wood chipper was loaned free of charge, and was operated by Gardening staff. The resulting pile of chippings will be used to help weed control in the shrubberies around the grounds.

The Gardeners, in conjunction with the Maintenance Department, transformed the sunken bed in the Sobell Pavilions into a water garden, consisting of two ponds, a stream, a waterfall and a small specimen tree.

Staff of English Nature and The Society releasing Zoo bred field crickets at a West Sussex site

Plumbing and electrical staff were involved in projects including the complete electrical refurbishment of the North Bank Pheasantry and holding rooms, and the staff shower system in the Elephant House.

Additional work included re-opening the North Bank, upgrading the Main Gate, painting the Aquarium frontage, and improving the exterior of all the catering outlets.

The Sealion pool was re-landscaped and the rock work cleared of unwanted plants. The Zoo boundaries, which were cleared in the 1991/92 season, were planted with shrubs removed from other

Retail

The Clock Tower housed a 'Panda' retail outlet to capitalize on the presence of 'Bao Bao' and 'Ming Ming'. The Discovery Shop was open on busy days, with a Peter Rabbit theme dominating over the Easter holidays, to coincide with the Frederick Warne promotion.

Stocks were reduced to artificially low levels in the summer, in preparation for possible liquidation, resulting in lower spending levels at a crucial trading period. With staffing costs and other expenditure kept to an absolute minimum, the retail operation achieved budgeted net profits for the year, despite the shortfall in visitor numbers.

New retail 'concessions' were introduced to complement existing facilities and net contributions from these operations have made a useful addition to trading activities.

A computerized stock-control system will be implemented in the next financial year, to produce more timely and accurate management information.

A mail-order catalogue is being initiated in conjunction with the Marketing Department, which should help to combat the seasonality of the visitor dependent shops.

Visitor Operations Department

A structured training programme for the Firearms Team was successfully completed; 12 members were trained in the use of firearms and in marksmanship, by staff at the Police Firearms Training School.

Westminster City Council granted authorisation to operate the clinical incinerator, in accordance with the requirements of the Environmental Protection Act, 1990.

Action commenced in the latter half of 1992 to upgrade various facilities to comply with Health and Safety legislation, emanating from EC Directives.

Daily animal encounters, feeding and animal-handling sessions continued to prove a major attraction. The Events Team concentrated on the high-profile 'Animals in Action', and presented a total of 353 shows in the five months of the summer season, to demonstrate the natural behaviour of animals. Boa constrictors, Brown rats, Quaker parakeets and a Caracal lynx were added to the presentation. Other activities involving the Events Team included a fund-raising matinée at Sadler's Wells, which featured a presentation by the Zoo, Animal Encounters during the interval, followed by a performance of Carnival of the Animals by the French 'Ballet du Rhin'. The team made a number of TV appearances with animals (The Really Wild Show, Parallel

Liberty's, the famous West End store, donated to the Society a marble elephant, carved in India and weighing 4½ tons. Peter Denton, Clerk to the Council, is seen with Neil Duffield at the formal handover in July

, Kilroy) and took part in the Royal stitution Lectures.

Special events during the year included n attempt on the world mass juggling ecord, a celebration of the Elephant in Jumbo Weekend', kindly sponsored by irgin Atlantic, and the now customary hristmas promotion.

oo Hospitality

he announced closure of the Zoo dversely affected Banqueting revenue, pecially Christmas bookings and wedding ceptions for 1993. The loss of the quarium for functions due to Health and afety requirements was very disappoint- g to a number of regular clients and trimental to Christmas revenue as in revious years the Aquarium had rep- sented 27% of total revenue. However, is was offset by a 58% increase in anqueting revenue from January 1993 wards against the same months last ear, due to a more pro-active procedure.

On the Visitor Catering side, value for oney was seen to be very important, and rices remained competitive.

There was a major re-organisation sulting, regrettably, in eight redundan- es and the re-contracting of staff on duced hours. This was based on com- ercial logic linked to the need to reduce sts, not only in labour, but to improve efficiency in all areas. Despite a difficult trading year, net profit increased by 11% over the previous year.

Marketing

By Spring, visitor numbers were 28% below budget due to bad weather, the economic situation, and the lack of a coordinated marketing strategy. However, the announcement in June that the Zoo was to close resulted in an increase in visitors which redressed the immediate shortfall. Aborted advertising campaigns meant that the Zoo had to rely on press coverage to maintain its profile which enabled advertising costs to be kept to a minimum. The threat of closure resulted in a fall in autumn group sales figures.

Since the September announcement that the Zoo would remain open, the restructured Marketing department has worked to build the public's confidence in the Zoo and develop a strong marketing and communications strategy for the Business Plan. A survey undertaken in December 1992 revealed the effect of the 1991/92 uncertainties: 31% of people in the catchment area saw the Zoo as closed, closing, or did not know what the situation was. The department has been working to redress this image. The launch of the Zoo's development plan gained massive coverage and was the first step to building a new image. Volunteers, Fellows, Adopters and Lifewatch members were sent a poster outlining the plans for the new Zoo, and the response was extremely positive. A new advertising agency, Harari Page, was selected.

Despite the turbulent year, London Zoo continued to gain the support of visitors and members of the public with an increase in Lifewatch membership and a high rate of renewal. A mailing to lapsed members

Jackie Ossowski and Vanessa Long with 'Sooty' and 'Sweep', the Black Shetland ponies, received a first class award in the annual Regent's Park Horse Harness Parade

with details of the developments generated over £5,000 worth of membership revenue. A new Lifewatch T-shirt was designed and produced by the fashion store 'Off the Cuff' who donated £1,000 from their sales. Panda Licorice also donated £1,000 to Lifewatch after selling 500 of their watches. Both donations were used to help fund Richard Kock's conservation project in Kenya (see page 20). In March 1993 it was decided to operate separate membership schemes for London Zoo and Whipsnade.

The Adopt an Animal scheme had a rather difficult year. Adopters were worried that 'their' animal would not remain at the Zoo and that they would be supporting a lost cause. A large number of press releases were circulated during the autumn to generate Christmas adoptions and received good coverage. Graham Gooch was a celebrity adopter in November.

Joint promotions

One of the most significant promotions was with Aries Design for a range of wildlife greetings cards, which also feature a voucher admitting one child free at twenty UK zoos and wildlife attractions. The cards will be on sale nationally during 1993, and the Zoo will receive 10 pence per card. The Christmas promotion was kindly supported by Encyclopaedia Britannica, Panda Drinks and Russ Berrie Trolls.

PRESS AND PUBLIC RELATIONS

This year London Zoo was rarely out of the media spotlight. Despite the difficult summer with the fight to keep London Zoo open, and with many internal politics made public, good contacts continued to be made within the media and excellent relations were maintained. Throughout the year, the Zoo received extensive TV, radio and newspaper coverage, both nationally and internationally. The French, American, Dutch, German and Japanese press were particularly interested in the Zoo's situation.

On 17 June 1992, the President announced that London Zoo was to close in September, and the Zoo hit the headlines. Ten days later, the Kuwaiti Embassy announced the very generous donation of £1 million from the Emir of Kuwait to help keep the Zoo open. This led to national press and television coverage and strong interest in the Zoo's fight for survival. All the press conferences held by the Zoo during the summer months were well attended and the resulting publicity raised awareness of the Zoo's important conservation and education work.

In September, a packed press conference heard that, thanks to the generosity of the Emir, the work of the staff and the welcome support of the public, London Zoo would stay open. A further announcement was made in October that the in-house management plan had been adopted.

Molly Dineen's much heralded four part documentary series 'The Ark' was screened by BBC2 in January 1993, to great acclaim. Many interviews were conducted with Molly and the keepers who became 'stars'.

In February, the plans for London Zoo were unveiled at a press conference. Twenty-four hours of extensive media coverage was secured. The PR value of this was calculated to be over £2 million for the television exposure and over £174,000 for the newspaper coverage.

The Zoo hosted many photocalls for other organisations throughout the year gaining revenue and publicity. These included Drinkwise, the British Safety Council, WWF, NSPCC, Mercury Communications, Spillers and Barclays Life.

The Zoo was also used as a location for filming and photography, including 'Surprise Surprise', 'The Really Wild Show' 'Open Space', 'The Late Show', 'Horizon', 'Blue Peter' and 'Nature Watch'. In August, the BBC produced a programme solely about the Zoo and its conservation work as a 'Nature Special'. Other good publicity was achieved by appearances made by staff on many television and radio programmes, including 'Jim'll Fix It', 'Kilroy', 'Parallel 9', 'Gloria Hunniford', 'Saturday Disney', and the 'Natural History Programme'.

The Zoo continued to be supported by celebrities. Professor David Bellamy gave great support to the campaign to keep the Zoo open. TV weatherman Michael Fish launched the new Life-watch T-shirt, actress Lynda Bellingham generously gave her time to back the Aries Design card promotion, animal actor Peter Elliott brought drama students from the Central School of Drama into the Zoo regularly and gained publicity for the Zoo through many interviews about his work, and actress Catherine Shipton adopted 'Kumba' the Gorilla.

In January, Lexis PR, a public relations agency, was appointed to provide expertise and assistance to the Marketing department's communications strategy for London Zoo.

The Society continues to host visits from such organisations as the Variety Club, Spastics Society and Rotary Clubs. Residents of the Sheffield Cheshire Home are shown during their visit with Andy Hallsworth and 'Tyto' the Barn owl

EDUCATION

London Zoo

The priorities this year have been the volunteer scheme, maintaining awareness among schools that the Zoo is still open and the production of new graphics. In light of the Zoo's financial difficulties, the department cut costs by almost 50% and increased income through sales of educational resource materials, evening classes, hiring the lecture halls and the Education Season Ticket. The latter continues to be very successful and, following a mailout to colleges in London, has been taken up by 167 students studying zoology, art, dance and drama. For a fixed fee, they are entitled to unlimited access to the Zoo for a year. In May, a second day for families and children with special needs was organised which was attended by over 2,000 people.

Learning opportunities for visitors

Throughout the year two self-guided trails have been available from the Information Kiosk to children and their parents. One, an Eye-Spy trail, takes the form of a treasure hunt and encourages families to look more closely at animal shape, colour and behaviour; the other is based on the hand-felted wall hanging in the Clore Pavilion which depicts the Amazon rainforest. A third guided tour has been developed by volunteers.

School visits

Attendances were somewhat erratic this year with a surge of visits during the summer before the impending closure, followed by a drop in the autumn. However, a newsletter later in the term, confirming that the Zoo was still open and giving news of breeding successes, brought in 1,500 children for the Christmas activities alone. Total attendances for the year were 42,100, representing a slight increase.

New materials developed include a 'Behaviour' pack for A-level students and 'Senses and Nocturnal Animals' for primary school children. 'Keeping Animals in Captivity' for secondary schools has proved very popular with English classes discussing topical issues. Westminster City Council successfully sponsored school visits for one year by every child in its care.

Special lectures were arranged, in conjunction with Rentokil, for students studying tourism and catering.

Adult evening classes

This year saw the start of the department's evening class 'Animal Ecology and Conservation' which was run in conjunction with Southwark College for ten weeks in April and again the following January. Over 35 people attended and, according to the questionnaire at the end, thoroughly enjoyed it and asked for further courses.

Graphics

Responsibility for new labelling on the animal enclosures was taken on by the Education department working in close liaison with the keepers. Over 100 new panels have been written to ensure that every species in the gardens is labelled. The original A4 portrait format has been developed to provide landscape formats for larger enclosures. A selected few well-known characters, such as 'Eros' the Snowy owl, have been accorded their own label giving their lifestory. Special graphics were written for young children in the Children's Zoo.

Lady Porter, a great supporter of the Zoo, and when Lord Mayor of Westminster, visited the Zoo to hand over an educational sponsorship cheque for £20,000 and at the same time to adopt an Asiatic lion. She is shown with a group of schoolchildren standing in front of the Lion enclosure

Volunteers

A great deal has been achieved this year towards making improvements to the scheme and in raising the standard of volunteer participation and training. The Volunteer Agreement was introduced, setting out clearly the level of commitment required and the benefits to be received. A new and more comprehensive training programme has been put into operation with nine full-day sessions including the history of the Society, captive breeding, customer care, practical skills and basic biology and classification. A recruitment campaign drew many applications—so far 40 people have been interviewed and accepted.

At Christmas, a team of volunteers designed and decorated Santa's Grotto and helped with the 'Living Nativity'. In the summer, the volunteers celebrated their 10th anniversary with a party.

WHIPSNADE WILD ANIMAL PARK

Visitors during the year: 409,719
Cars brought into the Park: 37,659

THE COLLECTION

The new regional organisation of the collection proved a success. White rhino, Roan antelope, Waterbuck and Sitatunga integrated well in 'Africa'. The 'Passage through Asia' now holds over 150 animals of six deer species, Nilgai and Blackbuck. The Chinese Water deer also settled in successfully.

One Brolga crane chick was reared for the first time in Europe bringing to ten the number of crane species bred at Whipsnade. The first Nile lechwe to be born in the United Kingdom was reared successfully, but unfortunately the second adult female died after the difficult birth of a stillborn infant. Every effort is now being made to increase the herd but with so few in European collections, this is proving difficult.

The two female Bongo which arrived from Regent's Park in 1991 each gave birth and both young were reared successfully. The pair of Dwarf crocodiles on loan from Copenhagen Zoo produced a clutch of eleven eggs. Although seven were fertile and developed fully, they did not hatch. Efforts are continuing to hatch the first Dwarf crocodile in the United Kingdom.

A very unusual event took place towards the end of the year with the birth of twins to chimpanzee 'Primrose'. Unfortunately, neither survived the first week.

Clive Bates, as deputy for the 'Asia' region, spent six weeks in Saratov, Russia helping with the incubation and rearing of Great bustards. This was part of a five year programme signed in 1992 aimed specifically at the conservation of this bird through the exchange of ideas and expertise. Seven eggs were laid but none was fertile.

A male Yak was brought in from Sweden to add new blood to the herd.

Whipsnade has joined London Zoo as an approved breeding collection for the Golden Lion tamarin, a male tamarin from Denmark joining one of the females after quarantine. Another female will be sent to Holland as part of the international programme. The return of the Black rhino to Whipsnade is planned for 1993.

GENERAL

Attendances fell by 15% compared to 1991/92. This was attributable to very bad weather during key days—22 days of rain in August alone, the impact of the London Zoo closure announcement and the recession.

However, despite the dramatic fall in visitor attendance, the previous operating losses of £959,000 (1990/91) and £861,000 (1991/92) have been reduced to some £70,000. This major achievement has only been possible through tight cost control and the hard work of Whipsnade staff.

EVENTS

The Steam Weekend (May Bank Holiday) was the best ever seen at Whipsnade with many traction engines and Whipsnade's own Steam Railway providing a focal point for the attractions.

Successful company days were held in the Park for Computer Associates, Lucas Aerospace and Microsoft, and the British Ambulance Preservation Society. The Park also hosted Britannia Airways' Kids Day Out on 5 July. BP renewed their adoption of 'Bumps', the Bactrian camel, and held a Staff Day in the Park to coincide with 'Bumps' second birthday. Teddy Bear 1992 was also well attended.

A cycle weekend was held in October, a scouts day attracting more than 900 scouts and the annual WWF sponsored walk with over 4,500 participants.

MARKETING

Bedfordshire County Council held its Tourism Forum at Whipsnade in November. Meetings to promote Whipsnade were held with the local Chamber of Commerce, coach operators and Rotary Clubs.

Familiarisation days have been held for coach operators, and the travel trade with group business forming a growing percentage of the visitor mixture.

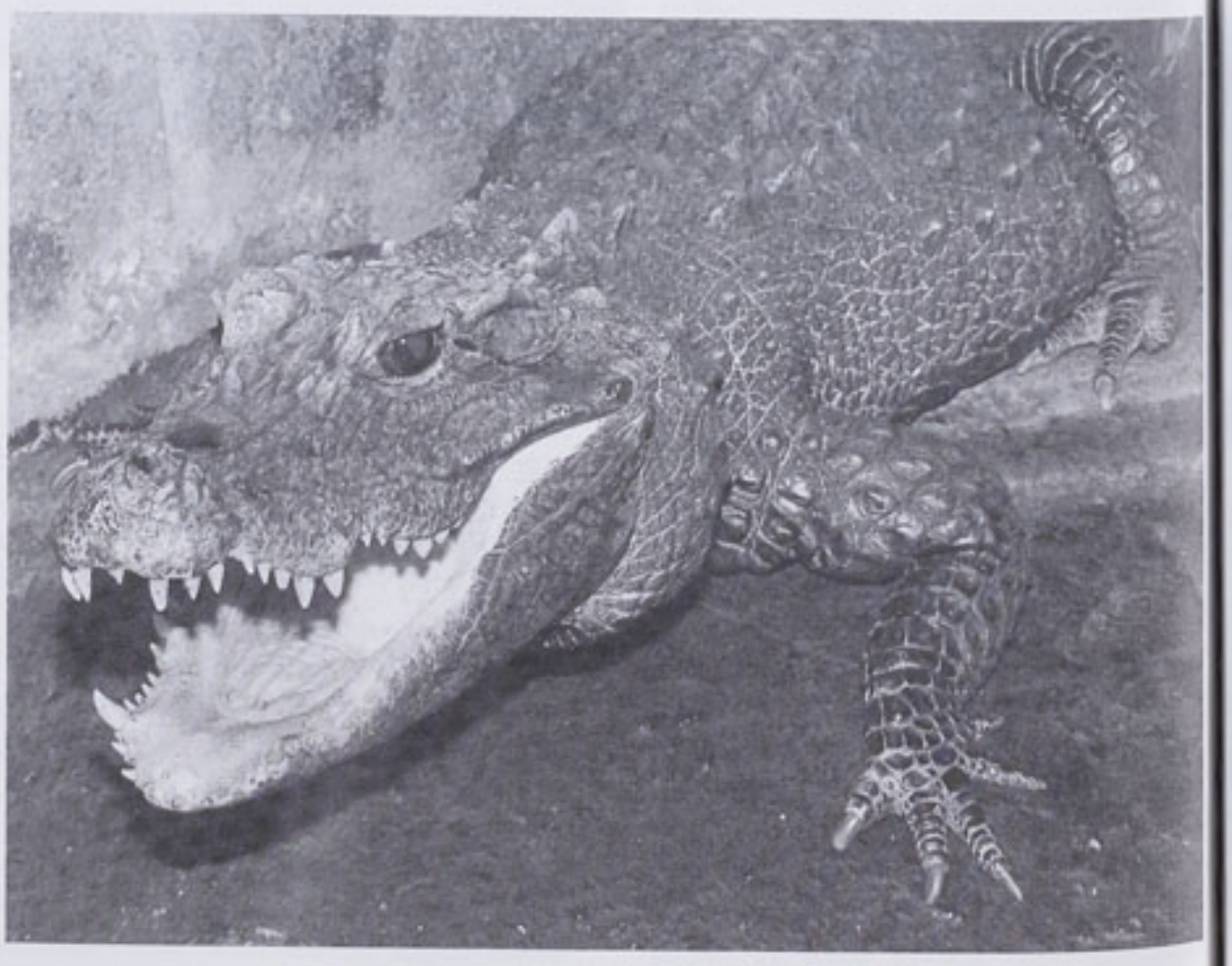
Christmas World produced above budget attendance figures, and was enhanced by a new winter schedule which offered visitors three hours of indoor entertainment.

BBC Radio Bedfordshire twice broadcast its morning show from the Park and the 'Really Wild Show' was filmed at Whipsnade in August.

The Marketing department attended the British Travel Trade Fair in April, the Gloucester Day Out Fair, the Coach Expo in September and Excursion 1992 at Wembley.

Promotions were arranged with Adams Clothes in Oxford Street, Choice Magazine, Avis Rentacar, Royal Mail Leisure Magazine, British Telecom, Harrods, 'You' Magazine, Thames and Chiltern Tourist Board, Evening Standard, Amway, British Aerospace, Bedford Moat House and Chiltern Radio.

Current market research showed that 87% of visitors felt that Whipsnade was either good or very good value for money and 94% would recommend a visit to a friend. The average stay in the Park last



Dwarf crocodile. One of a pair on loan from Copenhagen Zoo

Nile lechwe

5.11 hours and 47% of visitors spend over six hours at Whipsnade.

AWARDS

The Whipsnade advertisement 'Out of Bedfordshire' won an IPA: a Silver Award for Advertising Effectiveness.

GRAPHICS

Eleven new graphic interpretative structures were completed and installed throughout the Park. This centralised information board system within each of the regions or main paddock areas enables the Park to display a story board approach allowing visitors to see the animals in the context of their habitat, and includes more specific information on the geographical location.

Education

The Field Studies Centre was completed—including three dipping ponds—and has proved popular.

School attendances continued to rise during the year, with 23,639 children visiting the Park as part of an organised visit. Margaret Williams, Senior Education Officer, was invited to join the British Zoo Federation's Education Committee. The Outreach Scheme has proved very successful, not only with schools, but also libraries, fetes, hospitals and similar organisations.

A strong relationship has been formed with Bedfordshire as an industrial link to schools; this has meant that teachers may be seconded to develop information packs for use in schools and the Park, and are also involved with planning various BTEC courses. In addition, the department acts as a schools' link for the Dian Fossey Gorilla Fund.

Help for teachers using the Park is given in the form of teacher pre-visits, teacher packs and training evenings.

The Education Officers are closely involved in the graphics production around the Park.

The Siberian tigers are seen in their large enclosure, Tiger Falls, opened by HRH Prince Edward — 1991.

(Photo: 'aerial' view by Panabode Ltd)

CONSERVATION AND CONSULTANCY DIVISION

The Conservation and Consultancy Division was established as an independent section of the Society in May 1992. It occupies its own quarters in the old Development Trust offices in London Zoo. Its Director is David Jones, assisted by Conservation Officer Alexandra Dixon.

The Division's principal project continues to be the King Khalid Wildlife Research Centre at Thumamah in Saudi Arabia. Now in the sixth year of the contract to the National Commission for Wildlife Conservation and Development, the project employs 43 staff of widely different nationalities (Filipino, Sri Lankan, Sudanese and Egyptian as well as British) to fill a range of jobs from fence maintenance to field ecology. Changes in senior staff began in March 1992 with the departure of Mr Nick Lindsay (now Curator at Whipsnade) and Dr Frank Rietkerk to be replaced respectively by Mr Charlie Kichenside, a former overseer at London Zoo, and Dr Nigel Brown. Most recently Dr Timothy Wacher has taken up a further post of Field Ecologist, reflecting the Society's expanding involvement in ecological monitoring and survey projects in The Kingdom.

Two re-introduction projects for gazelle are well established and two more are under development. In the National Ibex Reserve at Howtah, 45 Idmi gazelles born at the King Khalid Wildlife Research Centre have been released into the wild and have bred well. Close to 100 animals can now be found in the reserve with the gazelles calving twice a year in many cases, a testament to their general good health. Eleven gazelles have died or disappeared, of which seven were eaten by an equally endangered Arabian wolf. This posed quite a dilemma for project staff but in the end the wolf moved on. Further reintroductions are planned for Wadi Bordan and further South in the Rhub Al-Khali (The Empty Quarter) where Arabian oryx are also intended for release.

In Africa, Richard Kock began his first year of secondment to the Kenya Wildlife Service as their Chief Veterinarian. Jointly funded by the Overseas Development Administration, Richard is charged with immediate wildlife care as well as the investigation of disease and the training of Kenyan nationals to replace him. We

Pictured above, left to right – Top row: The Central area; Peter Oldfield Murray with Sheikh Hasher Al Maktoum; an Uplighter by Carvill Lighting. Middle row: The BCFA Information area and William Timym's famous life size sculpture of Guy at London Zoo. A lifesize bronze sculpture of a lion's head also by William Timym was the centrepiece for the British Group, courtesy of The Oxford Partnership. Bottom row: BCFA wall graphics in the central area, which also included a photographic display of Middle Eastern animals that had been saved by the London Zoo.

A feature of a recent exhibition at the World Trade Centre in Dubai was a display of the Society's Conservation and Consultancy Division. The centre piece was a lifesize bronze sculpture of a lion's head by William Timym

re very grateful to Land Rover for their upport of this project.

Dr Rob Brett's secondment continues at he request of the Kenya Wildlife Service ntil April 1994. This extension of Rob's ontract was generously made possible hrough the contributions of Mr Adam aith and an anonymous donor. With the ocal population of Black rhino in the wild ow less than 2,000, the Kenya programme is vital to the future of the species nd is probably the most stable of the frican national programmes.

The Division was appointed Technical dviser to the Faith Foundation in eptember. Consultancies generated sigificant income and several projects are urrently underway. Dr Barkley Hastings as seconded to the Al-Ain Zoo under ontract to the British Council, to deal ith a foot-and-mouth outbreak, and preliminary designs for a small zoo outside Madinah were commissioned. Further projects and consultancies are reported in Appendix 5.

World Trade Exhibition in Dubai

Many thousands of visitors to the World Trade Exhibition in Dubai in October saw a presentation of the Society's work in the Middle East in collaboration with the J S Bonnington Architectural Practice, with whom the Society has worked on most of the major zoo projects in that region.

This was a British-led exhibition on design and architecture which had as its centre piece one of the famous bronze lions' heads by William Timym, a sculptor well-known to the Society, who died recently. Surrounding the head was an exhibition of the Division's work in field research and conservation in the Gulf region, highlighting oryx and gazelles. An adjacent stand displayed a large-scale illustrated review of all our zoo design work in the Arabian peninsula over the last 15 years, in particular the Doha project and the master planning work for both Kuwait and Dubai.

Professor R. McNeill Alexander
SECRETARY

COMMITTEES AND BOARDS 1992–1993

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Terms of Reference: To advise Council on matters relating to Animal Welfare in the collections, at both London Zoo and Whipsnade Wild Animal Park, at the Institute of Zoology and in the work of the Conservation and Consultancy Division.

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J K Kirkwood, BVSc, PhD, MRCVS (from 1.11.1992)

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Terms of Reference: To formulate and keep under review the conservation policy of the Society, and scrutinise, oversee and approve the activities of the Conservation and Consultancy Division in line with the Society's Mission Statement and Objectives.

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Mrs Karen Underwood
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Journal of Zoology, Symposia, Nomenclator Zoologicus, Zoological Record
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Laboratory Superintendent (Nuffield): P G Cottingham, BTec(CED), MIScT
Laboratory Superintendent (Wellcome & Hospital): G F Nevill, HND
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Senior Workshop Technician: W G Ray, AIScT
Senior Photographic Technician: T R Dennett
Photographic Technician: Mandy Walton, OND(Graphic Design)
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Zuckerman Research Fellow: H D M Moore (*Head of Group*) (until 31.10.92)
Research Fellows: A S I Loudon, PhD (*Head of Group*) (from 9.11.92); B R Brinklow, PhD; A P F Flint, PhD, DSc, FIBiol (to 26.2.93); W V Holt, PhD; Helen J Shaw, PhD; Leeanda J Wilton PhD (until 30.6.92); Georgina E Webley, PhD; Anne Stirland PhD
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Senior Animal Technician: A G Hartley, BAgriSc;
Animal Technician: Caroline Layram, OND
Technicians: Sheila C Boddy, BSc; D J Cheesman, BTec, HNC; Isabel A Lea, BSc (until 30.10.92); Philippa L Marsden, Bsc; Yasmin N Mohammad, MSc; R D North, BSc; Helen P O'Brian, BSc; Elizabeth C Piercy, BSc (until 22.1.93); Mary-Jo Searle, BSc; Maria A Valero-Aragon, MSc (until 28.8.92); Alexandra Whelan, BSc; S Francis, BSc.

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Technician: Jill G Pilkington, BSc

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Technicians: Elizabeth A Thornton, BSc; Fiona Webb, BSc (from 1.3.93);
Postgraduate Research Student: Nelly Ortiz Rodriguez, DVM, MSc;

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Research Fellows: P M Bennett, PhD; Frances Gulland MA VetMB, PhD
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Pathologist: A A Cunningham, BVMS, MRCVS
Research Associate: T Kuiken, DVM
Veterinary Officer (London): A W Sainsbury, BVMS, MRCVS
Veterinary House Surgeon (Whipsnade Wild Animal Park): J E F Barnett, BSc, BMVSc, MRCVS (until 12.6.92) E Flach, MA, VetMD, MSc, MRCVS (from 8.6.92)
Senior Veterinary Nurse: A K Fitzgerald, VN

Technicians: Tracey Howard, TecII; S Macgregor, HTec
Veterinary Nurses: Christine Dean, VN; Judith Howlett, VN; Meryl D Lang
Postgraduate Veterinary Training Course Supervisor: B E Hastings, DVM (until 27.11.92)
Technical Administrator Veterinary Course: Anemie Scholten (until 14.9.92)
Technician: Alison J Beasey, BAgriSc

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Cash Book Keeper: Miss L Archer-Morgan
Chief Cashier: D P Lack
Cashiers: L Oxley; J A Piggott; Mrs Z M Argyelan
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Wages Clerk: Miss J Owen
Accounts Clerk: P A Gibbs

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Secretary: Mrs I Finch
Conservation Officer: Miss A Dixon, BA, MSc

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Animal Management Division
Curator: J H W Gipps, PhD (to 15.6.92) (16.6.92 Post Vacant)
Assistant to Curator: Miss S K Christie
Zoological Assistant: D J Shepherdson, PhD
Registrar/Secretary: Miss E M Chaplin; Miss C Kelly
Collection Manager & Keeper In Charge of Small Mammals: W A B James
Collection Manager & Keeper In Charge of Carnivores: D M Richardson
Collection Manager & Keeper In Charge of Reptiles: D J Risley
Keepers In Charge: M E Carman; B J Harman; J H Pullen; G S Asher; Miss T Webb; B Harris; P Pearce-Kelly
Senior Keepers: M S Clark; Miss A James; J B Robson; F Wheeler; R E Charter; P R Harrington; M A Hennessy; J Nicklin; D E Robinson; F W Smith; M J Tiley; Mrs L Walker; D Clarke; T W March; S J Matchett; A Maskell
Qualified Keepers: P A Spanner; M Fagg; S Mannell; R Dodd; J Buchan
Trainee Keepers: Mrs D Platt; Miss S Carter; M S Fitzpatrick; P Kybett; Miss M C Lamb; J Leng; Miss J W Ossowski; Mrs L Da Volls; J W Stevens; Miss C L Wilson; K J Carroll; Miss C J Connor; Miss A Ferguson; W K Spencer; Miss E L Wenman; S Young; Miss V Silverton; C Wickenden; Miss A M McKenna; Miss T Lee; J Boyd

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Secretary: Miss J Ratcliffe
Press Officer: Miss G Dobson
Membership Executive: Miss G Guarnieri
Sponsorship and Promotions Executive: Mrs J Rattue

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Education Officers: R Humby, BSc; Miss G L Wedge
Sales & Bookings Co-ordinator: Mrs V Timperley

General Services Department
General Services Manager: G Roden
Contracts Co-ordinator: M J Swallow
Maintenance Supervisor: P Davies
Secretary: Mrs D Price
Building Craftsmen: P D Bell; A Connolly; M Foster; J C Froud; T Sheehan; D Brain.
Electricians: C G Rolfe; R Fitzgerald
Handymen/Labourers: J Baker; W F Manly
Gardens Supervisor: Miss J C Smith
Chargehands: Miss V Kiss; M Morrice
Gardeners: B M Clougherty; D Burke; R J Lynch; Miss M Malka; Mrs Y Morris
Purchasing & Transport Chargehand: R J Pearce
Drivers/Stores Assistants: R E Harrison; R Ashmore; A W James
Supplies Buyer: C P Major
Signmaker/Print & Stationery Buyer: A Taylor

Retail Department
Retail Manager: Mrs Y Ubels
Assistant Retail Manager: Mrs J Powell
Office Administrator: Mrs B A Kinsella
Supervisors: G Constantine; Mrs Y Nicholas
Warehouse Supervisor: R Bruce
Sales Assistants: Miss P M Delius; Miss D A Houlder

Visitor Operations Department
Visitor Operations Manager: B Nutkins
Secretary: Miss S A O'Neill
Admissions Officer: R McLaughlin
Asst. Admissions Officer: Mrs S Cole
Senior Gatekeeper: C Ramdass
Gatekeeper: K Ganatra
Service Gatekeepers: P K Brown; P A J Gabriel
Gatekeeper/Cashiers: J W Richards; T E Mohan
Gatekeeper/Car Park Attendants: S Sturgeon; Mrs V Rickards
Grounds Supervisor: P Walker-Croft
Groundstaff Chargehand: J Turner
Drivers: G A Houlder; O Tiwari
Groundsperson/Sweeper: P M Speck; A W Ransome
Toilet Attendants: Mrs B Ampong; Miss B M Lee

First Aid Attendant: Miss G A Reay
Receptionists: D Hitchcock; Miss T A Butler
Telephonists: Mrs P Passfield; Mrs A Maskell; Mrs B Ambrose
Events Co-ordinator: R Tomlinson
Senior Presenter: A Hallsworth
Gatekeeper/Cashier: Miss M Katzer; Miss R MacDonald; Miss J Simmons
Car Park Attendant: A Aremu
Driver: A Mackinnon

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Accounts Clerk: Mrs C Davies
Accounts Assistant: Mrs M Jenkins
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Support Services Chargehand: M Shillingford
Deputy Support Services Chargehand: G Guild
Supplies Co-ordinator: A Latham
Building Craftsmen: D Law; J Whinnett, J C Harrold; M Guild
Support Services Staff: J E Baisbrown; J Bradley
Arborist: A Southern

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Visitor Operations Manager: L Killorn
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Senior Gatekeeper: H Jackson
Cleaners: S Shury; Mrs C Penrice; Mrs R Wingate; C Deller

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Supervisor: Miss M Matthews

Railway

Railway Manager: F Crawley
Engineer: I Gordon

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Office Supervisor and Secretary to Curator: Mrs G Richards
General Secretary: Miss A Steward
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Animal Activities Co-ordinator: L J Radford
Deputy, Activities: G Frost
Animal Activities Staff: Miss J Pardoe; P Williams
Deputy Co-ordinators: C Bates; R G Wingate; C Tack
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Trainee Keepers: D Fisher; N Rogers; N Williams; S Copeland; C Emblem-English

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Hospitality Manager: Miss L Tiarks
Senior Chef: P Sheridan
Trainee Assistant Chef: N Winch
Catering Supervisor: Miss M Keeting
Senior Catering Supervisor: Miss S Weir
General Catering Assistants: Miss Z Fitzpatrick; Mrs M Grizzell

Marketing Department

Marketing Manager: Miss C Robinson
Marketing Assistant: Miss C Boys
Development Manager: Miss F Sutton
Adoptions Administrator: Miss S Winter

Education Department

Senior Education Officer: Miss M L Williams, BSc, PGCE
Education Officer: Mrs F J O'Neill, BSc, PGCE
Volunteer Co-ordinator: G Lucas

CONSULTING STAFF

Honorary Veterinary Consultant: K C Meldrum, BVM and S, DVSM, MRCVS
Medical Referee: K H Lewis, MA, BM, BCh

VOLUNTEERS

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Toni Darton; Gladys Davies; Jennie Deco; Linda Deguire; Jane Dickenson; Kathleen Dixon; Dawn Doodes; Don Driver.

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Terry Tancredi; John Thompson; Maggie Tighe; M Tracey; Ashleigh Walls; Les Warwick; Amanda Waterfield; Ruth Williams; Keith Wilson; Marion Winter; David Wooderson; Jonathan Wright; Ray Zuberi.

Whipsnade Wild Animal Park

Karen Adams; Jean Anderson; Michael Atkins.

Heather Bardner; J Batchelor; Tim Bayliss; Kirsty Bevan; Tracey Booth; Tina Boundy; Jill Broad; Leile Brown; Chris Burton; Carol Butler.

Carolyn Cannings; Louise Carter; Kathleen Chapman; Anne Clark-Jones; Francis Clarke; Sidney Cocks; Maureen Cook; Marion Cowan; Ronald Cowan.

Eileen Dent; Catherine Dyer; Kathleen Eames; Kenneth Eames; Arthur Ellis; Pamela Erwood; Tracy French; Mary Frost; Michelle Garlick; Denis Garner; Erica Godman; Robert Green; Jim Griffin.

Norman Hancock; Pauline Hodgson; Peter Huggins; Geraldine Irving; Dorothy Jane Isaacs; Austin Janes; Gordon Jewry-Phillips; Jeff Knowles.

Dorothy Lawson; Jennifer Lewis; Gillian Loose; Malcolm Mackenzie; Terence Manson; Eileen March; Miriam Martin; Julie Masters; Betty McHugh; Patricia Mitchell.

Lynn Paynter; Derrick Pendar; Lucy Pendar; Audrey Perrott; Ilid Putnam; Enid Ranson; Christopher Richardson.

Rebecca Sandifer; Raye Sawyer; Peter Scrivener; Cheryl Sharpe; Christine Sharpe; Kenneth Sharpe; Walter Smith; Mary Snoxall; Doreen Spencer; Tony Stevens; Marion Strapp; Paul Susman.

Hans van der Grinten; Arthur Waring; Elizabeth Webb; Naomi White; Patricia Wickens; Jennifer Wynn.

PUBLICATIONS BY SOCIETY'S STAFF AND RESEARCH WORKERS

Abayasekara, D R E, Jones, P M, Persaud, S J, Michael, A E & Flint, A P (1993). Prostaglandin $F_{2\alpha}$ activates protein kinase C in human ovarian cells. *Molecular and Cellular Endocr.* **91:** 53–57.

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ANIMALS IN THE COLLECTIONS

column 1 Number of animals in the Collection at 1st January 1992.

column 2 Number of animals received in 1992 by presentation, exchange, 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 during 1992.

column 4 Number of animals which died in 1992 within 30 days of birth or hatching. The figures in brackets indicate animals born or hatched during December 1991 and which died during January 1992.
Stillbirths are not included.

column 5 Number of animals which died from natural causes during 1992 apart from those included in column 4.

column 6 Number of animals disposed of in 1992 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 1992 showing sexes where these are known.
e.g. 1/3/1 indicates 1 male, 3 female, 1 sex unknown.

Key

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

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

**Free-ranging animals at Whipsnade censused once a year

LONDON ZOO		1	2	3	4	5	6	7
MAMMALS								
Monotremata								
Tachyglossus aculeatus	Australian Echidna	3	—	—	—	—	1	1/1
Zaglossus bruijni	Bruijn's Echidna	3	—	—	—	—	—	1/2
Marsupialia								
Phalanger gymnotis	Grey Ground Cuscus	3	1	—	—	—	—	2/2
Gymnobelideus leadbeateri	Leadbeater's Possum	12	—	—	—	3	—	6/3
Petaurus breviceps	Sugar Glider	—	4	—	—	—	—	2/2
Dasyuroides byrnei	Byrne's Pouched Mouse	3	—	—	—	1	—	1/1
Phascolarctos cinereus cinereus	New South Wales Koala	1	—	—	—	—	1	—
Potorous tridactylus	Long-nosed Potoroo	4	1	—	—	1	—	2/2
Macropus rufogriseus frutica	Red-necked Wallaby	4	—	—	—	—	—	1/3
Insectivora								
Erinaceus europaeus	European Hedgehog	—	2	—	—	—	—	0/0/2
Chiroptera								
Pteropus rodricensis	Rodriguez Fruit Bat	9	5	5	1	—	—	7/6/5
Carollia perspicillata	Seba's Short-tailed Bat	83	—	42	6	7	1	0/0/111
Scandentia								
Tupaia tana	Large Tree Shrew	1	—	—	—	—	—	0/1
Primates								
Lemur fulvus mayottensis	Brown Lemur	4	—	1	1	—	1	1/2
Varecia variegatus variegatus	Ruffed Lemur	1	—	—	—	—	—	0/1
Varecia variegatus rubra	Ruffed Lemur	2	—	—	—	—	—	1/1
Cheirogaleus medius	Fat-tailed Dwarf Lemur	6	—	—	—	1	—	2/3
Microcebus murinus	Grey Mouse Lemur	4	—	1	—	1	—	3/1
Loris tardigradus	Slender Loris	4	—	—	—	—	—	3/1
Nycticebus coucang	Slow Loris	3	—	—	—	—	—	2/1

		1	2	3	4	5	6	7
Nycticebus pygmaeus	Pygmy Slow Loris	2	1	—	—	1	—	1/1
Galago senegalensis	Senegal Bushbaby	3	—	—	—	—	1	1/1
Aotus trivirgatus boliviensis	Douroucouli	2	—	—	—	—	—	1/1
Pithecia pithecia	White-faced Saki Monkey	3	—	1	—	—	—	2/2
Ateles paniscus paniscus	Red-faced Black Spider Monkey	2	—	—	—	—	—	1/1
Callithrix argentata melanura	Silvery Marmoset	—	2	—	—	—	—	1/1
Cebuella pygmaea	Pygmy Marmoset	5	—	3	2	—	—	3/3
Saguinus oedipus	Cotton-headed Tamarin	12	—	5	1	4	8	3/1
Saguinus imperator	Emperor Tamarin	2	—	—	—	—	—	1/1
Leontopithecus rosalia rosalia	Golden Lion Tamarin	5	5	—	—	1	—	4/5
Leontopithecus rosalia chrysomelas	Golden-headed Lion Tamarin	2	1	—	—	1	—	2/0
Callimico goeldii	Goeldi's Marmoset	11	—	4	1	2	2	2/8
Macaca nigra	Sulawesi Crested Macaque	7	—	1	—	—	1	3/4
Mandrillus sphinx	Mandrill	4	—	—	—	—	4	—
Cercopithecus diana diana	Diana Monkey	2	—	1	—	—	—	2/1
Cercopithecus hamlyni	Owl-faced Monkey	3	—	—	—	—	—	1/2
Colobus polykomos polykomos	Western Black & White Colobus Monkey	2	—	—	—	—	—	1/1
Presbytis entellus thersites	Hanuman Langur	3	—	1	—	—	—	2/2
Hylobates lar	Lar Gibbon	3	—	—	—	—	—	2/1
Pongo pygmaeus pygmaeus	Bornean Orang Utan	10	—	—	—	1	9	—
Pan troglodytes	Chimpanzee	11	—	—	—	—	—	4/7
Gorilla gorilla gorilla	W. Lowland Gorilla	5	—	—	—	—	—	1/4
Edentata								
Choloepus didactylus	Two-toed Sloth	2	—	—	—	—	—	1/1
Euphractus villosus	Hairy Armadillo	2	1	—	—	—	1	1/1
Rodentia								
Callosciurus prevostii	Prevost's Squirrel	—	4	—	—	—	2	1/1
Tamias townsendi	Townsend's Chipmunk	4	—	—	—	—	—	2/2
Tamias sibiricus	Siberian Chipmunk	2	6	4	—	2	—	7/3
Peromyscus polionotus	Oldfield Mouse	3	—	—	—	—	—	1/2
Phodopus sungorus	Dwarf Hamster	3	13	—	—	3	—	11/2
Cricetulus barabensis	Chinese Hamster	15	—	20	2	14	3	6/10
Gerbillus perpallidus	Pallid Gerbil	17	—	31	8	5	3	0/0/32
Meriones unguiculatus	Clawed Jird	3	—	—	—	2	—	0/1
Microtus strelzowi	Mountain Vole	3	—	—	—	1	—	2/0
Apodemus sylvaticus	Field Mouse	10	—	80	55	3	8	8/9/7
Micromys minutus	Harvest Mouse	2	—	—	—	—	—	0/2
Acomys cahirinus	Arabian Spiny Mouse	65	—	96	90	1	70	—
Acomys dimidiatus	Spiny Mouse	11	—	—	—	—	11	—
Acomys russatus	Golden Spiny Mouse (Black form)	25	—	49	17	3	24	6/18/6
Rattus rattus	Black Rat	60	—	101	11	4	88	0/0/58
Rattus norvegicus	Brown Rat	60	—	342	24	—	280	0/0/98
Myomis nitedula	Forest Dormouse	6	1	5	1	2	—	7/2
Muscardinus avellanarius	Common Dormouse	6	—	8	4	4	—	4/2
Hystrix africaeaustralis	Cape Crested Porcupine	2	1	—	—	—	1	1/1
Hystrix indica × H. cristata	Hybrid Indian × Crested Porcupine	1	—	—	—	1	—	—
Xerurus africanus	African Brush-tailed Porcupine	6	—	2	1	—	—	5/2
Dasyprocta aguti	Orange-rumped Agouti	16	—	11	5	2	—	2/2/16
Myoprocta pratti	Green Acouchi	7	—	4	2	2	2	2/1/2
Chinchilla laniger	Chinchilla	4	—	1	—	—	—	3/2
Octodon degus	Degu	9	—	5	5	2	—	4/3
Carnivora								
Canis lupus	Grey Wolf	5	—	—	—	2	—	1/2
Fennecus zerda	Fennec Fox	2	—	—	—	—	—	1/1
Ailuropoda melanoleuca	Giant Panda	2	—	—	—	—	—	1/1
Zomyx striatus	Zorilla	4	—	2	—	—	2	1/1/2
Martes martes	Pine Marten	2	—	—	—	—	—	1/1
Aonyx cinerea	Oriental Small-clawed Otter	2	1	—	—	—	1	1/1
Genetta tigrina	Blotched Genet	3	—	—	—	1	—	1/1
Arctictis binturong	Binturong	—	2	—	—	—	—	1/1
Suricata suricatta	Suricate Meerkat	2	—	—	—	—	—	1/1
Herpestes parvula	Dwarf Mongoose	14	—	—	—	—	4	2/2/6

			1	2	3	4	5	6	7
Mungos mungo	Banded Mongoose		—	2	—	—	—	—	1/1
Cynictis penicillata	Yellow Mongoose		10	—	7	—	1	2	5/6/3
Felis caracal	Caracal Lynx		—	1	—	—	—	—	0/1
Felis pardalis	Ocelot		2	—	2	—	—	—	3/1
Panthera leo persica	Asian Lion		4	—	2	2	—	—	2/2
Panthera tigris sumatrae	Sumatran Tiger		3	—	—	—	—	—	1/2
Panthera pardus saxicolor	Persian Leopard		2	—	—	—	—	—	1/1
Neofelis nebulosa nebulosa	Clouded Leopard		2	—	—	—	—	—	1/1
Panthera onca	Jaguar		1	—	—	—	—	1	—
Pinnipedia									
Arctocephalus australis	South American Fur Seal		—	2	—	—	—	—	1/1
Zalophus californianus	Californian Sealion		4	—	—	—	—	4	—
Proboscidea									
Elephas maximus	Asian Elephant		3	1	—	—	—	1	0/3
Perissodactyla									
*Equus burchelli antiquorum**	Chapman's Zebra		2	1	—	—	—	1	1/1
Diceros bicornis	Black Rhinoceros		2	—	—	—	—	—	1/1
Artiodactyla									
*Lama glama**	Llama		2	1(1)	—	—	—	1	2/0
Vicugna vicugna	Vicuna		4	—	—	—	—	4	—
*Camelus bactrianus**	Bactrian Camel		4	—	—	—	—	1(1)	0/3
*Pudu pudu**	Pudu		2	—	1	—	—	—	2/1
Rangifer tarandus	Reindeer		3	—	—	—	—	—	0/3
Okapia johnstoni	Okapi		2	—	—	—	—	—	1/1
*Giraffa camelopardalis**	Giraffe		5	—	3	—	—	1	2/5
*Tragelaphus strepsiceros**	Greater Kudu		6	—	—	—	2	—	1/3
*Bubalus depressicornis**	Anoa		4	—	1	1	—	—	1/3
*Oryx leucoryx**	Arabian Oryx		6	—	3	—	—	2	2/5
Gazella gazella arabica	Arabian Gazelle		—	3	—	—	—	—	3/0
Domestic									
	Cattle	Friesian	2	—	—	—	—	2	—
		Hereford	—	2	—	—	—	—	0/2
	Goat:	Common	3	—	—	—	—	—	0/3
		Nubian	1	—	—	—	—	—	0/1
	Sheep:	Dorset Down	3	—	—	—	—	—	0/3
		Black Welsh Mountain	1	—	—	—	—	—	1/0
		Jacob's	1	—	—	—	—	—	1/0
	Rabbit		4	6	26	8	—	10	12/6
	Guineapig		11	3	2	—	4	—	3/9
	Donkey		2	2	—	—	—	2	1/1
	Pony:	Cream	—	2	—	—	—	—	2/0
		Shetland	3	—	—	—	—	—	0/3
		Dartmoor	1	—	—	—	—	—	0/1
Total Mammals:			734	77(1)	873	248	85	561(1)	790
BIRDS									
Sphenisciformes									
Spheniscus demersus	Blackfooted (Jackass) Penguin		56	—	10	5	1	20	12/3/15
Spheniscus humboldti	Humboldt's Penguin		2	—	—	—	1	—	0/1
Pelecaniformes									
Pelecanus onocrotalus	Eastern White Pelican		6	—	—	—	1	—	0/0/5
Pelecanus occidentalis	Brown Pelican		4	—	—	—	2	—	0/0/2
Morus bassanus	Gannet		3	—	—	—	—	—	1/0/2
Phalacrocorax carbo	Cormorant		5	—	—	—	4	—	0/0/1

		1	2	3	4	5	6	7
Ciconiiformes								
Nycticorax nycticorax	Night Heron	4	—	—	—	1	—	0/1/2
Ardeola ibis	Cattle Egret	13	—	—	—	1	—	1/2/9
Ardea cinerea	Grey Heron	4	—	—	—	2	—	0/0/2
Ciconia abdimii	Abdim's Stork	11	—	—	—	1	—	0/0/10
Leptoptilos crumeniferus	Marabou Stork	2	—	—	—	—	—	0/2
Threskiornis aethiopicus	Sacred Ibis	27	—	14	10	4	—	0/027
Eudocimus ruber	Scarlet Ibis	7	—	2	1	—	—	4/4
Platalea alba	African Spoonbill	4	—	—	—	—	—	0/0/4
Phoenicopterus chilensis	Chilean Flamingo	41	—	—	—	—	—	17/24
Anseriformes								
Dendrocygna bicolor	Fulvous Whistling Duck	2	—	—	—	—	—	0/0/2
Dendrocygna viduata	White-faced Tree Duck	6	—	1	1	1	—	0/1/4
Dendrocygna arborea	Cuban Tree Duck	1	—	—	—	1	—	—
Branta sandvicensis	Hawaiian Goose	1	—	—	—	—	1	—
Branta bernicla orientalis	Brent Goose	4	—	—	—	—	1	2/1
Aix sponsa	Carolina Duck	9	—	4	4	2	—	2/5
Callonetta leucophrys	Ringed Teal	13	—	—	—	3	—	7/3
Anas penelope	Wigeon	3	—	26	9	4	—	9/7
Anas americana	American Wigeon	2	—	—	—	1	—	0/1
Anas sibilatrix	Chiloe Wigeon	10	—	2	—	5	—	2/3/2
Anas sibilatrix × Aythya fuligula	Chiloe Wigeon × Tufted Duck	3	—	—	—	—	—	1/2
Anas strepera	Gadwall	2	—	—	—	1	—	0/1
Anas crecca	Teal	1	—	—	—	1	—	—
Anas capensis	Cape Teal	2	—	—	—	—	—	1/1
Anas acuta	Pintail	5	—	7	—	2	1	6/3
Anas bahamensis	Bahama Pintail	3	—	—	—	—	—	0/0/3
Anas versicolor puna	Puna Teal	4	—	1	1	—	—	2/2
Anas punctata	Hottentot Teal	1	—	—	—	—	—	1/0
Anas querquedula	Garganey	9	—	—	—	—	—	7/2
Anas clypeata	Shoveler	1	—	—	—	—	—	1/0
Marmaronetta angustirostris	Marbled Teal	1	—	—	—	1	—	—
Netta rufina	Red-crested Pochard	5	—	—	—	—	—	3/2
Aythya valisineria	Canvasback	4	—	—	—	—	—	2/2
Aythya ferina	European Pochard	4	—	—	—	—	—	2/2
Aythya fuligula	Tufted Duck	4	—	1	—	1	—	1/3
Somateria mollissima	Eider Duck	12	—	6	4	2	—	7/5
Bucephala clangula	Goldeneye	1	—	—	—	—	—	0/1
Mergus albellus	Smew	2	—	—	—	—	—	1/1
Mergus merganser	Goosander	4	—	—	—	—	—	1/3
Oxyura jamaicensis jamaicensis	North American Ruddy Duck	6	—	—	—	2	—	2/2
Falconiformes								
Milvus migrans migrans	Black Kite	1	—	—	—	—	—	0/0/1
Torgos tracheliotus	Lappet-faced Vulture	2	—	—	—	—	—	1/1
Terathopius ecaudatus	Bateleur Eagle	2	—	—	—	1	—	1/0
Polyboroides typus	Harrier Hawk	2	—	1	—	—	—	1/1/1
Polihierax semitorquatus	African Pygmy Falcon	2	—	1	1	1	—	1/0
Galliformes								
Penelope purpurascens	Crested Guan	2	1	—	—	—	—	1/2
Crax fasciolata	Bare-faced Curassow	2	—	—	—	—	—	1/1
Francolinus pondicerianus	Indian Grey Francolin	—	1	—	—	—	—	1/0
Tragopan satyra	Satyr Tragopan	2	—	—	—	—	—	1/1
Tragopan temminckii	Temminck's Tragopan	2	—	4	4	—	—	1/1
Polyplectron impeyanus	Impeyan Pheasant	2	—	4	—	—	—	3/3
Syrmaticus edwardsi	Edward's Pheasant	—	4	—	—	—	—	2/2
Crossoptilon crossoptilon	White Eared Pheasant	1	—	—	—	—	—	0/1
Lophura wallichi	Cheer Pheasant	2	—	13	11	2	—	1/1
Syrmaticus humiae	Hume's Bar-tailed Pheasant	2	—	11	8	1	—	2/2
Syrmaticus mikado	Mikado Pheasant	2	—	4	—	1	—	2/3
Pavo cristatus	Common Peafowl	2	—	3	—	—	2	1/2
Afropavo congensis	Congo Peafowl	3	—	—	—	1	—	1/1
Acryllium vulturinum	Vulturine Guineafowl	5	—	10	5	1	—	2/3/4

		1	2	3	4	5	6	7
Gruiformes								
Grus japonensis	Red-crowned Crane	2	—	1	—	—	—	2/1
Grus vipio	White-naped Crane	2	—	—	—	1	—	1/0
Anthropoides virgo	Demoiselle Crane	2	—	2	1	—	—	1/2
Charadriiformes								
Haematopus ostralegus	Oystercatcher	3	—	—	—	3	—	—
Recurvirostra avosetta	Avocet	1	—	—	—	—	1	—
Burhinus oedicnemus	Stone Curlew	2	—	—	—	—	—	1/1
Numenius arquata	Curlew	1	—	—	—	—	—	0/0/1
Tringa totanus	Redshank	2	—	—	—	1	—	0/0/1
Philomachus pugnax	Ruff	1	—	—	—	—	—	1/0
Larus cirrocephalus poiocephalus	Grey-headed Gull	24	—	8	—	1	6	0/0/25
Larosterna inca	Inca Tern	4	—	4	3	—	—	1/4
Uria aalge	Guillemot (Murre)	2	—	—	—	—	—	0/0/2
Columbiformes								
Pterocles alchata	Pintailed Sandgrouse	2	—	—	—	1	—	1/0
Columba guinea	Speckled Pigeon	27	—	6	1	5	—	0/0/27
Ducula bicolor	Pied Imperial Pigeon	—	2	—	—	—	—	0/0/2
Psittaciformes								
Charmosyna pulchella rothschildi	Fairy Lorikeet	2	—	1	—	—	—	2/1
Cacatua alba	White-crested Cockatoo	2	—	—	—	—	—	1/1
Cacatua tenuirostris pastinator	Western Slender-billed Cockatoo	1	1	—	—	—	—	1/1
Nestor notabilis	Kea	2	—	—	—	1	—	1/0
Polytelis alexandrae	Princess of Wales' Parrakeet	3	—	2	2	—	—	2/1
Poicephalus robustus	Cape Parrot	2	—	—	—	—	—	1/1
Anodorhynchus hyacinthinus	Hyacinth Macaw	2	4	—	—	—	1	3/2
Ara chloroptera	Green-winged Macaw	1	—	—	—	1	—	—
Enicognathus ferrugineus	Austral Conure	—	2	—	—	—	—	1/1
Enicognathus leptorhynchus	Slender-billed Conure	—	4	—	—	—	—	2/1/1
Myiopsitta monachus	Quaker (Monk)Parrakeet	12	2	19	—	5	5	0/0/23
Amazona ochrocephala	Yellow-crowned Amazon	—	1	—	—	—	—	0/1
Cuculiformes								
Tauraco persa livingstonii	Livingstone's Turaco	2	—	5	2	—	3	1/1
Tauraco erythrolophus	Red-crested Turaco	2	—	1	1	—	—	1/1
Tauraco hartlaubi	Hartlaub's Turaco	2	—	—	—	—	—	1/1
Tauraco leucotis	White-cheeked Turaco	7	—	5	—	2	1	2/2/5
Strigiformes								
Tyto alba	Barn Owl	4	1	—	—	—	2	1/1/1
Otus bakkamoena	Collared Scops Owls	2	—	—	—	—	—	1/1
Otus leucotis	White-faced Scops Owls	6	—	—	—	—	1	2/3
Bubo bubo turcomanus	Turkmenian Eagle Owl	2	—	3	—	—	5	—
Bubo capensis mackinderi	Kenyan Eagle Owl	—	1	—	—	—	—	1/0
Bubo vosseleri	Nduk Eagle Owl	2	—	—	—	1	—	1/0
Pulsatrix perspicillata	Spectacled Owl	2	—	1	1	—	—	1/1
Nyctea scandiaca	Snowy Owl	2	—	—	—	—	—	1/1
Ninox novaeseelandiae	Boobook Owl	2	—	3	—	—	—	1/1/3
Athene brama	Spotted Owlet	2	—	1	1	—	—	1/1
Speotyto cunicularia	Burrowing Owl	1	2	4	—	1	—	1/4
Strix hylophila	Rusty Barred Owl	2	—	—	—	—	—	1/1
Strix uralensis	Ural Owl	4	—	—	—	—	—	2/2
Strix nebulosa	Great Grey Owl	1	—	—	—	—	—	1/0
Coraciiformes								
Dacelo novaeguineae	Kookaburra	3	—	2	2	—	—	1/1/1
Coracias caudata	Lilac-breasted Roller	—	2	—	—	—	—	0/0/2
Tockus erythrorhynchus	Red-billed Hornbill	2	—	—	—	1	—	1/0
Penelopides panini	Tarictic Hornbill	2	—	—	—	1	—	1/0
Anthracoceros coronatus convexus	Southern Pied Hornbill	3	—	—	—	—	—	1/2
Bycanistes subcylindricus	Black and White Casqued Hornbill	2	—	—	—	—	—	1/1

		1	2	3	4	5	6	7
Buceros bicornis	Great Indian Hornbill	1	—	—	—	—	—	0/1
Buceros hydrocorax	Rufous Hornbill	2	—	—	—	—	—	1/1
Piciformes								
Calopogon pyrolophus	Fire-tufted Barbet	2	—	—	—	1	—	1/0
Lybius dubius	Bearded Barbet	—	2	—	—	—	—	1/1
Pteroglossus aracari	Black-necked Aracari	2	—	—	—	—	—	1/1
Pteroglossus castanotis	Chestnut-eared Aracari	1	—	—	—	—	—	0/1
Ramphastos bailloni	Saffron Toucanet	2	—	—	—	—	—	1/1
Melanerpes candidus	White Woodpecker	1	—	—	—	—	—	0/1
Passeriformes								
Procnias nudicollis	Naked-throated Bellbird	1	—	—	—	—	—	1/0
Pycnonotus jocosus	Red-whiskered Bulbul	2	—	—	—	—	—	1/1
Irena puella	Fairy Bluebird	2	—	—	—	—	—	1/1
Garrulax leucolophus	White-crested Laughing Thrush	2	—	—	—	—	—	1/1
Garrulax pectoralis	Necklaced Laughing Thrush	1	—	—	—	—	—	0/0/1
Garrulax chinensis	Black-throated Laughing Thrush	2	—	—	—	—	—	1/1
Garrulax sannio	White-browed Laughing Thrush	2	—	—	—	1	—	0/0/1
Leiothrix argentauris	Silver-eared Mesia	2	—	—	—	—	—	1/1
Leiothrix lutea	Pekin Robin (Red-billed Leiothrix)	1	—	—	—	—	—	0/0/1
Zosterops sp.	White-eye	2	—	—	—	—	—	0/0/2
Paroaria coronata	Red-crested Cardinal	2	—	—	—	—	—	1/1
Acridotheres chopi	Chopi Grackle	1	—	—	—	—	—	1/0
Emberiza acuticauda hecki	Heck's Grass Finch	2	—	—	—	—	—	1/1
Erythrura trichroa	Blue-faced Parrot Finch	1	—	—	—	—	—	1/0
Quelea quelea	Red-beaked Weaver (Quelea)	2	—	—	—	—	—	1/1
Foudia flavicans	Rodriguez Fody	4	1	—	—	1	—	2/2
Lamprotornis iris	Emerald Glossy Starling	2	—	—	—	—	—	1/1
Spreo superbus	Superb Glossy Starling	2	—	9	6	—	—	1/1/3
Creatophora cinerea	Wattled Starling	—	2	—	—	—	—	1/1
Sturnus roseus	Rose-coloured Starling	2	—	—	—	—	—	1/1
Sturnus contra	Asian Pied Starling	2	—	2	1	—	—	1/1/1
Sturnus vulgaris	Common Starling	1	—	—	—	1	—	—
Leucopsar rothschildi	Rothschild's Mynah	5	—	—	—	—	1	2/2
Serpeliceps coronatus	Golden-crested Mynah	2	—	—	—	—	—	0/0/2
Gracula religiosa intermedia	Nepal Hill Mynah	2	—	—	—	—	—	1/1
Cyanocorax chrysops	Plush-crested Jay	2	—	—	—	1	—	0/1
Corvus corax corax	Raven	2	—	—	—	2	—	—
Domestic								
	Common Duck	2	2	—	—	1	—	0/3
	Old English Game Bantam	1	—	—	—	1	—	—
	Domestic Chicken	5	—	—	—	—	—	0/5
	Total: Birds	579	35	204	85	87	57	595

REPTILES

Testudines								
Sternotherus odoratus	Stinkpot	1	—	—	—	—	—	1/0
Kinosternon subrubrum	Eastern Mud Terrapin	1	—	—	—	—	—	0/0/1
Kinosternon scorpioides	Scorpion Mud Terrapin	2	—	—	—	—	—	1/1
Pseudemys scripta dorbignyi	South American Ornate Terrapin	1	—	—	—	—	—	0/1
Pseudemys scripta elegans	Red-eared Terrapin	6	—	—	—	—	—	1/3/2
Terrapene carolina triunguis	Three-toed Box Terrapin	2	—	—	—	1	—	1/0
Testudo graeca	Spur-thighed Tortoise	2	3	—	—	—	—	2/3
Malacochersus tornieri	Pancake Tortoise	1	—	—	—	—	—	1/0
Geochelone carbonaria	Red-footed Tortoise	—	1	—	—	—	—	1/0
Eretmochelys imbricata	Hawksbill Turtle	3	—	—	—	—	—	0/1/2
Chelus fimbriatus	Matamata	5	—	—	—	—	—	0/1/4
Chelodina longicollis	Long-necked Terrapin	5	—	—	—	—	—	2/3
Trionyx hurum	Peacock Soft-shelled Turtle	2	—	—	—	—	—	1/1

		1	2	3	4	5	6	7
Crocodylia								
Crocodylus niloticus	Nile Crocodile	—	3	—	—	—	—	1/2
Alligator sinensis	Chinese Alligator	7	1	—	—	—	3	1/2/2
Sauria								
Teratoscincus scincus	Frog-eyed Sand Gecko	1	—	—	—	—	—	1/0
Hemitheconyx caudicinctus	African Fat-tailed Gecko	4	—	—	—	—	—	0/2/2
Chondrodactylus angulifer	Namib Sand Gecko	5	—	1	—	—	3	1/1/1
Gekko gecko	Tokay Gecko	2	—	—	—	1	—	0/1
Phelsuma lineata pusilla	Lined Day Gecko	—	17	—	—	—	—	0/0/17
Phelsuma standingi	Standing's Day Gecko	—	6	—	—	—	—	1/1/4
Coleonyx variegatus	Western Banded Gecko	1	2	—	—	—	—	2/1
Eublepharis macularius	Leopard Ground Gecko	4	—	—	—	—	—	2/2
Laemanctus longipes deborrei	Casque-headed Lizard	1	—	—	—	—	—	0/1
Basiliscus plumifrons	Plumed Basilisk	—	3	—	—	—	—	2/1
Cyclura cornuta	Rhinoceros Iguana	4	—	—	—	—	—	3/1
Amphibolurus vitticeps	Inland Bearded Dragon	4	—	6	—	3	—	2/2/3
Uromastyx hardwicki	General Hardwick's Dabb Lizard	3	—	—	—	1	2	—
Egernia striolata	Australian Tree Skink	2	—	—	—	—	—	1/1
Corucia zebrata	Prehensile-tailed Skink	6	—	—	—	—	1	0/0/5
Trachydosaurus rugosus	Shingleback	3	—	—	—	—	—	1/2
Tiliqua scincoides scincoides	Eastern Blue-tongued Skink	—	3	—	—	—	—	1/2
Tiliqua scincoides intermedia	Northern Blue-tongued Skink	2	—	—	—	—	—	1/1
Mabuya quinquetaeniata	Five-lined Skink	2	—	—	—	1	—	0/0/1
Eumeces schneiderii	Schneider's Skink	3	—	—	—	—	—	0/0/3
Chalcides ocellatus	Eyed Skink	3	—	—	—	—	—	1/1/1
Gerrhosaurus major	Greater Plated Lizard	3	—	—	—	—	—	2/1
Lacerta lepida	Eyed Lizard	2	2	—	—	—	2	1/1
Trogonophis wiegmanni	Wiegmann's Burrowing Lizard	1	—	—	—	—	—	0/0/1
Varanus exanthematicus exanthematicus	Bosc's Monitor	2	1	—	—	—	—	1/0/2
Varanus niloticus	Nile Monitor	—	1	—	—	—	1	—
Heloderma suspectum suspectum	Reticulated Gila Monster	9	3	—	—	1	3	2/3/3
Heloderma suspectum cinctum	Banded Gila Monster	2	—	—	—	—	2	—
Anguis fragilis	Slow-worm	2	—	—	—	—	—	0/0/2
Cordylus giganteus	Sungazer	8	—	—	—	2	—	0/0/6
Serpentes								
Liasis boa	Bismark Ringed Python	4	—	—	—	—	1	0/0/3
Morelia spilotus spilotus	Diamond Python	1	—	—	—	—	—	1/0
Python reticulatus	Reticulated Python	—	1	—	—	—	1	—
Python molurus bivittatus	Burmese Rock Python	2	2	—	—	1	—	2/1
Python sebae	African Rock Python	—	1	—	—	—	1	—
Python regius	Royal Python	5	1	—	—	—	—	1/0/5
Boa constrictor	Boa Constrictor	5	1	—	—	—	1	0/2/3
Natrix natrix	Grass Snake	1	—	—	—	—	—	0/0/1
Thamnophis sirtalis	Common Garter Snake	—	1	—	—	—	1	—
Drymarchon corais couperi	Eastern Indigo Snake	1	—	—	—	—	—	1/0
Elaphe guttata	Corn Snake	—	1	—	—	—	1	—
Elaphe obsoleta quadrivittata	Yellow Rat Snake	1	—	—	—	—	1	—
Elaphe radiata	Radiated Rat Snake	1	—	—	—	—	—	0/0/1
Pituophis catenifer	Bull Snake	—	1	—	—	—	1	—
Pituophis melanoleucus melanoleucus	Northern Pine Snake	2	1	—	—	—	1	1/1
Hydrodynastes gigas	Boipevassu Snake	2	—	5	—	—	3	1/1/2
Heterodon nasicus	Western Hog-nosed Snake	1	—	—	—	—	1	—
Coronella austriaca	Smooth Snake	2	—	—	—	1	—	1/0
Lampropeltis getulus floridana	Florida King Snake	1	—	—	—	—	—	0/0/1
Lampropeltis getulus californiae	Californian King Snake	2	1	4	—	2	3	1/1
Lampropeltis triangulum sinaloae	Sinaloan Milk Snake	2	—	2	1	—	—	1/1/1
Psammophis subtaeniatus	Peter's Long-lined Snake	1	—	—	—	—	—	0/0/1
Dispholidus typus	Boomslang	2	—	—	—	1	—	0/1
Oxyuranus scutellatus	Taipan	4	—	—	—	—	—	1/2/1
Notechis scutatus	Tiger Snake	2	—	—	—	—	—	1/1
Naja pallida	Red Spitting Cobra	2	—	—	—	—	—	1/1

		1	2	3	4	5	6	7
Naja naja kaouthia	Monocellate Cobra	2	—	—	—	1	—	1/0
Micrurus fulvius	Eastern Coral Snake	1	—	—	—	1	—	—
Dendroaspis angusticeps	Common Green Mamba	2	—	—	—	—	—	1/1
Vipera berus	Adder	1	—	—	—	—	—	0/1
Vipera ammodytes ammodytes	Western Long-nosed Viper	3	—	—	—	—	—	2/1
Vipera russelli siamensis	Russell's Viper	2	—	—	—	—	1	1/0
Bitis arietans	Puff Adder	2	—	—	—	—	—	1/1
Bitis gabonica gabonica	Gaboon Viper	1	1	—	—	—	—	1/1
Echis carinatus sochureki	Saw-scaled Viper	9	—	—	—	1	—	1/2/5
Echis carinatus ocellatus	West African Saw-scaled Viper	2	—	—	—	—	—	1/0/1
Echis carinatus leakeyi	East African Saw-scaled Viper	3	—	—	—	—	—	1/2
Agkistrodon piscivorus	Cottonmouth Moccasin	1	—	—	—	—	—	0/0/1
Calloselasma rhodostoma	Malayan Pit Viper	9	—	—	—	—	—	1/2/6
Trimeresurus purpureomaculatus	Mangrove Pit Viper	2	—	—	—	1	—	0/0/1
Bothrops atrox	Fer-de-Lance	—	1	—	—	—	—	0/1
Bothrops moojeni	Moojen's Fer-de-Lance	1	—	—	—	—	—	0/0/1
Sistrurus catenatus tergeminus	Western Massasauga	2	—	—	—	1	—	1/0
Crotalus durissus culminatus	North Western Neotropical Rattlesnake	2	—	—	—	—	—	1/1
Crotalus atrox	Western Diamond-back Rattlesnake	2	—	—	—	2	—	—
Crotalus scutulatus	Mojave Rattlesnake	—	2	—	—	—	—	1/1
Crotalus viridis oreganus	Northern Pacific Rattlesnake	1	—	—	—	—	1	—
Crotalus mitchelli	Speckled Rattlesnake	1	—	—	—	—	—	1/0
Crotalus cerastes	Sidewinder	1	—	—	—	—	—	0/0/1
	Total: Reptiles	**211**	**61**	**18**	**1**	**22**	**35**	**232**

AMPHIBIANS

Caudata								
Ambystoma maculatum	American Spotted Salamander	6	—	—	—	5	—	0/0/1
Ambystoma mexicanum	Axolotl	16	—	—	—	8	—	0/0/8
Ambystoma tigrinum	Tiger Salamander	2	—	—	—	2	—	—
Pleurodeles waltl	Spanish Ribbed Newt	5	—	30	—	—	27	0/0/8
Salamandra salamandra	Fire Salamander	17	—	—	—	7	—	0/0/10
Taricha torosa	Rough-skinned Newt	2	—	—	—	—	—	0/0/2
Triturus cristatus	Crested Newt	1	—	—	—	1	—	—
Triturus vulgaris	Smooth Newt	4	—	—	—	—	—	0/0/4
Pachytriton sp.	Dog-faced Newt	—	11	—	—	—	—	0/0/11
Anura								
Bombina orientalis	Oriental Fire-bellied Toad	2	20	—	—	2	—	0/0/20
Bombina variegata	Yellow-bellied Toad	1	—	—	—	1	—	—
Bufo rubropunctatus	Red-spotted Toad	—	10	—	—	3	—	0/0/7
Bufo marinus	Cane Toad	3	—	—	—	3	—	—
Bufo viridis	Green Toad	1	4	—	—	2	—	0/0/3
Colostethus trinitatus	Stream Frog	65	—	—	—	20	—	0/0/45
Dendrobates auratus	Poison Arrow Frog	7	—	—	—	7	—	—
Dendrobates truncatus	Poison Arrow Frog	7	—	—	—	6	—	0/0/1
Hyla cinerea	American Green Tree Frog	—	1	—	—	—	—	0/0/1
Hyla septentrionalis	Cuban Tree Frog	1	—	—	—	—	1	—
Kassina senegalensis	Running Frog	7	—	—	—	5	—	0/0/2
Litoria caerula	White's Tree Frog	7	—	—	—	—	7	—
Litoria infrafrenata	Giant Tree Frog	1	—	—	—	1	—	—
Hymenochirus sp.	Dwarf Surinam Toad	—	10	—	—	3	—	0/0/7
Pipa pipa	Surinam Toad	—	4	—	—	2	—	0/0/2
Mantella pulchara	Mantella	—	10	—	—	—	—	0/0/10
Rana catesbeiana	American Bullfrog	5	—	—	—	2	—	0/0/3

		1	2	3	4	5	6	7
Rana limnocharis	Rice Paddy Frog	3	—	—	—	3	—	—
Rana pipiens	Leopard Frog	1	—	—	—	—	—	0/0/1
Rana ridibunda	Marsh Frog	1	2	—	—	—	—	0/0/3
Rana temporaria	Common Frog	2	—	—	—	1	—	0/0/1
Xenopus laevis	Clawed Frog	5	3	—	—	2	—	0/0/6
Xenopus tropicalis	Clawed Frog	2	5	—	—	2	—	0/0/5
	Total: Amphibians	174	80	30	—	88	35	161

INVERTEBRATA

Details of the invertebrate collection have not been included in previous Annual Reports. On this occasion the numbers given represent animals held at the beginning of 1993.

CNIDARIA

Scyphozoa

Aurelia aurita	Moon Jellyfish	12

ANNELIDA

Hirudinea

Hirudo medicinalis	Medicinal Leech	20

MOLLUSCA

Gastropoda

Euglandina rosea	Predatory Snail	6
Achatina achatina	Giant Land Snail	2
Achatina fulica	Giant Land Snail	40
Archachatina marginata	West African Giant Land Snail	6
Ariolimax columbianus	Banana Slug	5
Partula arguta	Polynesian Tree Snail	7
Partula dentifera	Polynesian Tree Snail	34
Partula faba	Polynesian Tree Snail	200
Partula hebe	Polynesian Tree Snail	88
Partula mooreana	Polynesian Tree Snail	51
Partula rosea	Polynesian Tree Snail	10
Partula suturalis	Polynesian Tree Snail	512
Partula taeniata	Polynesian Tree Snail	8
Partula tohiveana	Polynesian Tree Snail	259
Partula turgida	Polynesian Tree Snail	116
Partula varia	Polynesian Tree Snail	186

ARTHROPODA

ARACHNIDA

Araneae

Nephila madacascariensis	Tropical Orb Spider	30
Avicularia avicularia	Pink-toed Bird-eating Spider	3
Euathlus emilia	Red-legged Bird-eating Spider	1
Euathlus smithii	Red-kneed Bird-eating Spider	250
Euathlus vagans	Red-rumped Bird-eating Spider	1
Lasiodora parahybana	Brazilian Bird-eating Spider	2
Poecilotheria formosa	Ornamental Tiger Spider	2
Latrodectus mactans	North American Black Widow Spider	1

Scorpiones

Androctonus crassicauda	Fat-tailed Scorpion	2
Buthus occitanus	Yellow Scorpion	4
Heterometrus spinifer	Asian Jungle Scorpion	5
Pandinus imperator	Imperial Scorpion	18

		1	2	3	4	5	6	7
CRUSTACEA								
Decapoda								
Birgus latro	Robber Crab	1						
Coenobita clypeatus	Land Hermit Crab	3						
DIPLOPODA								
Julida								
Graphidostreptus sp.	Giant Millipede	5						
Spirobolida								
Epibolus pulchripes	Mombassan Train Millipede	30						
INSECTA								
Blattodea								
Gromphadorhina portentosa	Malagasy Hissing Cockroach	30						
Periplaneta americana	American Cockroach	1000						
Periplaneta australasiae	Australian Cockroach	100						
Coleoptera								
Chrysocarabus olympiae	Olimpia's Ground Beetle	13						
Pachnoda sp.	Chafer Beetle	30						
Eucicella gralli	Jade Headed Buffalo Beetle	50						
Scarabeous semipunctatus	African Dung Beetle	6						
Blaps sp.	Desert Beetle	2						
Diptera								
Drosophila melanogaster	Fruit Fly	1000						
Hemiptera								
Platymerus biguttata	Assassin bug	40						
Hymenoptera								
Apis mellifera	Honeybee	C × 2						
Ampulex compressa	Jewel Wasp	20						
Atta cephalotes	Leaf-cutting Ant	C × 4						
Formica rufa	Red Wood Ant	C × 1						
	Note: C = one colony							
Lepidoptera								
Bombyx mori	Silkworm	100						
Heliconius melpomene	Postman Butterfly	50						
Saturnidae	mixed species	100						
Mantodea								
Sphodromantis sp.	African Praying Mantis	5						
Orthoptera								
Locusta migratoria	Migratory Locust	200						
Schistocerca gregaria	Desert Locust	500						
Gryllus bimaculatus	African Field Cricket	1000						
Gryllus campestris	British Field Cricket	250						
Pholeogryllus geertsi	Cave Cricket	200						
Hemideina crassidens	Wellington Tree Weta	40						
Decticus verrucivorus	British Wart-biter Cricket	3000						
Tetralla quadrata	Sri Lankan Bush Cricket	10						
Phasmatoptera								
Acrophylla wuelfingi	Queensland Titan Stick Insect	60						
Eurycantha sp.	Indonesian Spiny Stick Insect	40						
Extatosoma tiaratum	Macleay's Spectre Stick Insect	300						
Heteropteryx dilatata	Malaysian Jungle Nymph	30						
Pharnacia acanthopus	Giant Asian Stick Insect	20						
Pyllium sp.	Leaf Insect	30						

Total Invertebrata: approx. 64 species; 10146 specimens; 7 colonies

WHIPSNADE WILD ANIMAL PARK

MAMMALS

		1	2	3	4	5	6	7
Marsupialia								
Macropus rufogriseus frutica	Red-necked Wallaby**	477	—	—	—	—	—	546
Primates								
Varecia variegatus variegatus	Ruffed Lemur	1	—	—	—	—	1	—
Saimiri sciureus	Squirrel Monkey (Black-capped form)	16	—	3	—	1	1	4/10/3
Leontopithecus rosalia rosalia	Golden Lion Tamarin	2	1	—	—	—	—	1/2
Pan troglodytes	Chimpanzee	8	—	1	—	—	—	6/3
Rodentia								
Cynomys ludovicianus	Prairie Marmot**	234	—	—	—	—	—	250
Dolichotis patagonum	Mara**	40	—	—	—	—	—	75
Chinchilla laniger	Chinchilla	2	—	—	—	—	—	0/2
Carnivora								
Canis lupus	Grey Wolf	22	—	1	—	7	—	7/9
Ursus arctos	Brown Bear	6	—	—	—	1	—	2/3
Ailurus fulgens	Red Panda	2	—	—	—	—	—	1/1
Nasua nasua	Ring-tailed Coati	5	—	—	—	—	—	1/4
Suricata suricatta	Meerkat	—	1	—	—	—	—	0/1
Helogale parvula	Dwarf Mongoose	8	—	—	—	—	—	4/4
Panthera leo	Lion	2	—	—	—	—	—	1/1
Panthera tigris altaica	Siberian Tiger	3	—	1	1	—	—	1/2
Acinonyx jubatus	Cheetah	13	—	2	—	—	—	8/7
Pinnipedia								
Zalophus californianus	Californian Sealion	5	—	2	2	2	—	1/2
Phoca vitulina	Common Seal	1	—	—	—	—	—	1/0
Halichoerus grypus	Grey Seal	1	—	—	—	—	—	0/1
Proboscidea								
Elephas maximus	Asian Elephant	3	—	—	—	—	—	0/3
Perissodactyla								
*Equus burchelli antiquorum**	Common Zebra (Chapman's form)	2	—	—	—	—	1	1/0
*Equus grevyi**	Grevy's Zebra	7	—	1	—	—	—	2/6
*Equus hemionus**	Asiatic Wild Ass (Persian form)	12	—	—	—	1	1	2/8
*Equus przewalskii**	Przewalski's Horse	14	—	2	—	1	—	2/13
Rhinoceros unicornis	Indian Rhinoceros	3	—	—	—	—	—	2/1
Cerototherium simum	White Rhinoceros	8	1	1	—	—	1	4/5
Artiodactyla								
Hippopotamus amphibius	Hippopotamus	4	1	—	—	—	1	2/2
Choeropsis liberiensis	Pygmy Hippopotamus	3	—	1	1	—	—	1/2
*Lama glama**	Llama	5	—	—	—	1	2(1)	2/0
*Lama guanicoe**	Guanaco	1	—	—	—	1	—	—
Camelus bactrianus	Bactrian Camel	12	2(1)	2	—	—	1	4/11
Camelus dromedarius	Arabian Camel	1	—	1	1	1	—	—
Muntiacus reevesi	Reeves's Muntjac**	18	—	—	—	6	—	7/5
Dama dama	Fallow Deer	16	—	4	—	3	—	7/2/8
*Axis axis**	Axis Deer	44	—	20	—	16	—	15/27/6
*Axis porcinus**	Hog Deer	43	—	14	12	8	—	15/18/4
*Cervus duvauceli**	Barasingha	23	—	10	3	3	—	12/14/1
*Cervus nippon**	Sika Deer (Formosan form)	43	—	8	3	3	—	10/25/10
Cervus elaphus	Red Deer	120	—	1	3	—	26	27/64/1
*Elaphurus davidianus**	Père David's Deer	52	—	14	—	3	—	13/37/13
Rangifer tarandus	Reindeer	8	1	4	3	2	2	1/5
Hydropotes inermis	Chinese Water Deer**	342	—	—	—	—	—	358
*Giraffa camelopardalis**	Giraffe	3	—	—	—	1	1	1/0
*Giraffa camelopardalis reticulata**	Giraffe (Reticulated)	4	—	1	1	—	—	2/2
*Tragelaphus angasi**	Nyala	9	—	5	—	4	—	2/8
*Tragelaphus spekei**	Sitatunga	10	—	5	—	1	1	7/6
*Tragelaphus strepsiceros**	Greater Kudu	1	—	—	—	1	—	—
*Tragelaphus euryceros**	Bongo	3	—	2	—	—	—	2/3
*Boselaphus tragocamelus**	Nilgai	20	—	9	1	1	—	1/23/3
*Bos gaurus**	Gaur	5	—	1	—	—	—	3/3
Bos grunniens	Yak	14	1	3	—	4	2	3/6/3
*Syncerus caffer**	African Buffalo (Dwarf Forest form)	6	—	1	1	—	—	2/4

		1	2	3	4	5	6	7
Bison bison	American Bison	2	—	—	—	—	—	1/1
Bison bonasus	European Bison	9	—	1	—	2	1	1/5/1
*Hippotragus equinus**	Roan Antelope	11	—	2	—	1	—	6/6
*Hippotragus niger**	Sable Antelope	1	—	—	—	1	—	—
*Kobus ellipsiprymnus**	Common Waterbuck	7	—	—	—	—	2	1/4
Kobus megaceros	Nile Lechwe	4	—	2	1	1	—	3/1
*Oryx gazella**	Gemsbok	6	—	3	2	1	—	1/5
*Oryx dammah**	Scimitar-horned Oryx	24	6	2	3	3	6	4/16
*Oryx leucoryx**	Arabian Oryx	3	—	—	—	1	—	2/0
*Damaliscus dorcas**	Bontebok	3	—	—	—	—	—	0/3
*Antilope cervicapra**	Blackbuck	14	—	13	2	3	—	5/11/6
*Gazella thomsonii**	Thomson's Gazelle	6	—	3	1	2	—	4/2
Ovibos moschatus	Musk Ox	3	—	1	—	1	—	1/2
Ovis musimon	Mouflon	1	—	—	—	—	—	0/1
Ovis canadensis	Bighorn Sheep	9	—	—	—	2	—	4/3
Domestic								
	Shire Horse	2	—	—	—	1	—	1/0
	Cream Pony	1	—	1	—	—	—	1/1
	Welsh Pony (Cream form)	1	—	—	—	—	—	1/0
	Saddleback × Oxford Saddleback Pig	1	—	—	—	—	—	0/0/1
	Oxford Sandy & Black Pig	1	—	—	—	—	—	0/1
	Belted Galloway Cattle	1	—	—	—	—	—	1/0
	Red Poll Cattle	3	—	—	—	—	—	0/3
	Manx Loghtan Sheep	2	—	—	—	—	—	2/0
	Lincoln Longwool Sheep	1	—	—	—	—	—	0/1
	Wensleydale Sheep	2	—	—	—	1	—	0/1
	Hampshire Sheep	13	5	—	—	5	—	1/8/4
	Windsor White Goat	15	—	12	6	1	—	7/12/1
Total: Mammals		**1853**	**19(1)**	**160**	**47**	**98**	**50(1)**	**1973**
BIRDS								
Casuariiformes								
Casuarius casuarius	Australian Cassowary	2	—	—	—	—	—	1/1
Dromaius novaehollandiae	Emu	8	—	2	—	—	3	3/3/1
Sphenisciformes								
Aptenodytes patagonica	King Penguin	12	—	2	—	1	—	3/4/6
Eudyptes crestatus	Rockhopper Penguin	10	—	1	—	—	—	4/2/5
Spheniscus humboldti	Humboldt's Penguin	65	—	6	3	5	11	5/4/43
Ciconiiformes								
Ciconia ciconia	White Stork	16	—	3	1	1	4	3/4/6
Eudocimus ruber	Scarlet Ibis	5	2	5	3	—	—	0/0/9
Phoenicopterus ruber ruber	Rosy Flamingo	55	—	4	1	—	—	6/6/46
Anseriformes								
Cygnus atratus	Black Swan	2	—	2	—	—	—	2/0/2
Cygnus melanocoryphus	Black-necked Swan	2	—	—	—	1	—	0/1
Cygnus cygnus	Whooper Swan	5	—	—	—	—	—	1/1/3
Coscoroba coscoroba	Coscoroba Swan	2	—	—	—	—	—	1/1
Anser anser	Greylag Goose	1	—	—	—	1	—	—
Anser indicus	Bar-headed Goose	44	—	5	—	—	—	11/14/24
Anser canagicus	Emperor Goose	4	—	—	—	—	—	2/1/1
Branta leucopsis	Barnacle Goose	17	—	—	—	8	—	2/0/7
Branta bernicla orientalis	Brent Goose	1	—	—	—	—	—	0/1
Branta ruficollis	Red-breasted Goose	6	—	—	—	—	—	5/1
Alopochen aegyptiacus	Egyptian Goose	8	—	—	—	—	—	1/1/6
Tadorna cana	South African Shelduck	7	—	—	—	—	—	2/2/3

		1	2	3	4	5	6	7
Tadorna tadorna	Shelduck	6	—	—	—	—	—	4/2
Aix sponsa	Carolina Duck	1	—	—	—	—	—	0/1
Anas penelope	Wigeon	2	—	—	—	—	—	1/1
Anas sibilatrix	Chiloe Wigeon	1	—	—	—	—	—	1/0
Anas strepera	Gadwall	3	—	—	—	2	—	0/1
Anas crecca	Teal	1	—	—	—	—	—	1/0
Anas specularioides	Crested Duck	6	—	—	—	6	—	—
Anas acuta	Pintail	1	—	—	—	—	—	1/0
Anas clypeata	Shoveler	3	—	—	—	—	—	2/1
Netta rufina	Red-crested Pochard	5	—	—	—	—	—	2/3
Aythya fuligula	Tufted Duck	2	—	—	—	—	—	0/2
Aythya marila	Greater Scaup	3	—	—	—	2	—	0/1
Somateria mollissima	Eider Duck	16	—	6	3	2	—	4/7/6
Oxyura vittata	Argentine Ruddy Duck	1	—	—	—	1	—	—
Falconiformes								
Haliaeetus leucocephalus	Bald Eagle	1	—	—	—	—	—	0/1
Gyps africanus	African White-backed Vulture	1	—	—	—	—	—	1/0
Gyps rueppellii	Ruppell's Griffon Vulture	5	—	—	—	1	—	1/2/1
Parabuteo unicinctus	Harris' Hawk	1	—	—	—	—	—	1/0
Aquila rapax	Tawny Eagle	1	—	—	—	—	1	—
Falco biarmicus	Lanner Falcon	2	2	—	—	—	—	3/1
Falco cherrug	Saker Falcon	1	—	—	—	—	—	1/0
Falco peregrinus	Peregrine Falcon	1	—	—	—	—	1	—
Galliformes								
Francolinus erckelii	Erckel's Francolin	1	—	—	—	1	—	—
Lophophorus impeyanus	Impeyan Pheasant	1	—	—	—	1	—	—
Gallus gallus	Red Jungle Fowl**	22	—	—	—	1	—	10/10/1
Crossoptilon crossoptilon	White Eared Pheasant	2	—	—	—	—	—	1/1
Chrysolophus pictus	Golden Pheasant	1	—	—	—	—	1	—
Pavo cristatus	Common Peafowl**	139	—	—	—	—	—	120
Gruiformes								
Grus monacha	Hooded Crane	—	1	—	—	—	—	0/1
Grus japonensis	Red-crowned Crane	4	2	—	—	—	2	2/2
Grus vipio	White-naped Crane	4	—	1	—	—	—	2/2/1
Grus antigone	Sarus Crane	1	1	—	—	1	—	0/1
Crus rubicunda	Brolga	2	—	1	—	—	—	1/1/1
Bugeranus carunculatus	Wattled Crane	4	1	—	—	1	—	2/2
Anthropoides virgo	Demoiselle Crane	1	—	—	—	—	—	0/1
Anthropoides paradisea	Stanley Crane	4	—	1	—	1	—	2/2
Balearica regulorum	South African Crowned Crane	5	—	—	—	—	—	4/1
Cariama cristata	Red-legged Seriema	2	—	—	—	—	—	2/0
Otis tarda tarda	Great Bustard	5	1	—	—	1	—	3/2
Charadriiformes								
Haematopus ostralegus	Oystercatcher	6	—	—	—	—	—	0/0/6
Burhinus bistriatus	Double-striped Thick-knee	2	—	—	—	—	—	1/1
Psittaciformes								
Pseudeos fuscata	Dusky Lory	1	—	—	—	—	1	—
Cacatua galerita triton	Triton Cockatoo	1	—	—	—	—	1	—
Alisterus scapularis	King Parrot	2	—	—	—	—	2	—
Platycercus eximius cecilae	Golden-mantled Rosella	1	—	—	—	—	1	—
Ara macao	Scarlet Macaw	—	4	—	—	1	1	1/1
Ara chloroptera	Green-winged Macaw	1	—	—	—	—	1	—
Cyanoliseus patagonus	Patagonian Conure	10	—	—	—	—	7	1/0/2
Myiopsitta monachus	Quaker Parrakeet	7	—	—	—	—	3	1/1/2
Ara ararauna	Blue/Gold Macaw	—	1	—	—	—	—	0/1
Psittacula eupatria	Alexandrine Parrakeet	—	2	—	—	—	—	1/1
Strigiformes								
Tyto alba	Barn Owl	6	—	6	—	—	8	3/1
Otus leucotis	White-faced Scops Owl	4	—	3	—	—	—	2/5
Bubo bubo bengalensis	Bengal Eagle Owl	1	—	—	—	—	—	0/1

		1	2	3	4	5	6	7
Nyctea scandiaca	Snowy Owl	2	—	—	—	—	—	1/1
Strix aluco sylvatica	Tawny Owl	2	—	—	—	—	—	1/1
Coraciiformes								
Dacelo novaeguineae	Laughing Kookaburra	1	—	—	—	—	—	0/0/1
Piciformes								
Ramphastos vitellinus citreolaemus	Citron-throated Toucan	2	—	—	—	—	—	0/2
Passeriformes								
Carpodacus mexicanus	Mexican Rose Finch	—	6	—	—	—	—	3/3
Domestic								
	Birmingham Roller Pigeon	24	—	—	—	24	—	—
	Total: Birds	607	23	48	11	63	48	537

REPTILES

Testudines								
Testudo graeca	Spur-thighed Tortoise	13	—	—	—	—	13	—
Testudo hermanni	Hermann's Tortoise	9	1	—	—	—	—	2/7/1
Testudo kleinmanni	Kleinman's Tortoise	2	2	—	—	—	—	2/2
Geochelone denticulata	Yellow-footed Tortoise	3	—	—	—	—	—	1/2
Crocodylia								
Osteolaemus tetraspis	West African Dwarf Crocodile	2	—	—	—	—	—	1/1
Sauria								
Phelsuma madagascariensis grandis	Giant Day Gecko	4	—	—	—	4	—	—
Eublepharis macularius	Leopard Ground Gecko	12	2	1	1	—	10	1/3
Basiliscus plumifrons	Plumed Basilisk	7	—	—	—	3	—	0/4
Iguana iguana	Common Iguana	6	—	—	—	1	1	3/1
Eumeces schneiderii	Schneider's Skink	2	—	—	—	—	1	0/0/1
Scincus scincus	Sand Fish	3	—	—	—	1	—	0/0/2
Uromastyx aegypticus	Egyptian Dabb Lizard	3	—	—	—	—	—	0/0/3
Anolis carolinensis	Carolina Anolis Lizard	2	—	—	—	—	—	0/0/2
Anolis sagrei	Anolis Lizard	1	—	—	—	—	—	0/0/1
Ameiva sp.	Ameiva	2	—	—	—	1	—	0/0/1
Varanus exanthematicus	Bosc's Monitor	4	—	—	—	—	—	0/0/4
Serpentes								
Python molurus bivitatus	Burmese Python	11	—	—	—	2	3	1/2/3
Boa constrictor	Boa Constrictor	1	—	—	—	1	—	—
Corallus caninus	Emerald Tree Boa	2	—	—	—	2	—	—
Corallus enydris cooki	Cook's Tree Boa	2	—	5	—	2	2	1/2
Epicrates cenchria	Rainbow Boa	2	—	—	—	2	—	—
Thamnophis sirtalis	Garter Snake	3	—	—	—	3	—	—
Cerastes cerastes	Horned Cerastes Viper	4	—	—	—	—	—	1/3
Echis carinatus sochureki	Saw-scaled Viper	10	—	—	—	1	—	0/0/9
	Total: Reptiles	110	5	6	1	23	30	67

AMPHIBIANS

Anura								
Bufo marinus	Cane Toad	1	—	—	—	—	—	0/0/1
Ceratophrys cornuta	Horned Toad	2	—	—	—	—	—	0/0/2
Dendrobates auratus	Black/Green Poison Arrow Frog	4	20	—	—	9	—	0/0/15

		1	2	3	4	5	6	7	
Phylobates sp.	Poison Arrow Tree Frog	2	—	—	—	—	—	0/0/2	
Hyla septentrionalis	Cuban Tree Frog	1	—	—	—	1	—	—	
Rhacophorus dennysi	Giant Asian Tree Frog	4	—	—	—	3	—	0/0/1	
Ceratophrys ornata	Wide-mouthed Frog	—	1	—	—	—	—	0/0/1	
	Total: Amphibians	14	21	—	—	13	—	22	

SUMMARY

London Zoo

	1	2	3	4	5	6	7	Number of Species (excluding domestic)
Mammals	734	77(1)	873	248	85	561(1)	790	93
Birds	579	35	204	85	87	51	595	139
Reptiles	211	61	18	1	22	35	232	76
Amphibians	174	80	30	—	88	35	161	23
Total	**1698**	**253(1)**	**1125**	**334**	**282**	**682(1)**	**1778**	**333**

Estimated number of fishes and invertebrates in the Collection at 31 December 1992:

Fishes	Approx 3,700	202 species
Invertebrates (excluding some common species)	Approx 10,146 (+ 7 colonies)	64 species

Whipsnade Wild Animal Park

Mammals	1853	19(1)	160	47	98	50(1)	1973	63
Birds	607	23	48	11	63	48	537	66
Reptiles	110	5	6	1	23	30	67	18
Amphibians	14	21	—	—	13	—	22	6
Total	**2584**	**68(1)**	**214**	**59**	**197**	**128(1)**	**2599**	**153**

Estimated number of fishes and invertebrates in the Collection at 31 December 1992:

Fishes	Approx 80	14 species
Invertebrates (excluding some common species)	Approx 120	12 species

Grand Total Zoological Society of London	**4282**	**321**	**1339**	**393**	**479**	**810**	**4377**	**440***

*The species common to London Zoo and Whipsnade Wild Animal Park are counted as one

COLLABORATIVE RESEARCH, ADVISORY AND CONSULTANT SERVICES

AFRC Institute of Animal Physiology and Genetics Research, Roslin: Epidemiology of tropical theileriosis in Morocco.

AFRC & MRC Neuropathogenesis Unit, Edinburgh: Studies of spongiform encephalopathy in zoo ungulates; Spongiform encephalopathies of exotic bovids.

African Natural Heritage Trust: Technical advice, particularly on Uganda, Kenya and Zimbabwe.

The Alistair Reid Snake Venom Research Unit, WHO Collaborative Centre for the Control of Antivenoms, Liverpool School of Tropical Medicine: Advice on housing and management of venomous snakes.

Animal Diseases Research Association, Moredun Research Institute: Collaborative study on Toxoplasmosis in wallabies; Toxoplasmosis of captive wild animals; diseases of red deer.

Blood Transfusion Service: Malaria diagnosis.

British Airways Assisting Nature Conservation: Collaboration on conservation of Great Bustard.

British Council: Secondment of emergency veterinary staff to United Arab Emirates.

Central Science Laboratory, Surrey: Mass mortalities of the common frog.

Central Veterinary Laboratory, Surrey: Spongiform encephalopathies of exotic bovids, puffinosis in Manx shearwaters, mass mortalities of the common frog.

Chataburi Hospital, Thailand: Infectious disease diagnosis in blood banks.

Clinical Research Centre, Middlesex: Collaborative research on the evolutionary biology of alanine glyoxylate aminotransferase.

Dar Al-Handasah, Egypt: Preliminary designs for Madinah Zoo, Saudi Arabia.

English Nature: Management of site of special scientific interest (SSSI) at Whipsnade; (Training branch) advice on handling of venomous snakes.

Ethiopian Wildlife Conservation Organization: Signature of Memorandum of Understanding and assist with conservation in Ethiopia.

HM Customs: Housing and advice on identification of reptiles.

Hospital for Tropical Diseases: Malaria research.

INSERM, Paris: Collaborative studies on the molecular biology of hormone receptors with Prof Paul Kelly.

Institute of Animal Physiology and Genetics, Babraham, Cambridge: Collaborative studies on boar spermatozoa.

Institute of Terrestrial Ecology, Banchory: Collaborative research on the genetics of domesticated camelid breeds; parasites of European otters (*Lutra lutra*).

Institute of Virology & Environmental Microbiology, Oxford: Puffinosis in Manx shearwaters.

John Radcliffe Hospital, Oxford (Nuffield Department of Clinical Medicine): Advice on housing and management of venomous snakes.

Joint Nature Conservation Committee: Health assessment of red kites for reintroduction.

King's College (KQC), London (Department of Anatomy and Human Biology): Collaborative project investigating neuroendocrine aspects of reproductive suppression in naked mole-rats. *(Department of Biological Sciences):* Welfare of captive parrots.

London School of Hygiene and Tropical Medicine: Diagnostic methods.

Macaulay Land Use Research Institute, Aberdeen: Collaborative studies into the reproductive biology and control of puberty in Scottish red deer.

Macaulay Land Use Research Institute, Shotts: Collaborative research on the genetics of domesticated camelid breeds.

Madagascar Fauna Group: Advice on veterinary aspects of lemurs in Madagascar.

MAFF: Studies of reproductive technology in deer.

MAFF Central Veterinary Laboratory, Weybridge: Studies of spongiform encephalopathy in zoo ungulates and of virus diseases of zoo and wild animals.

MAFF Fisheries Laboratory, Burnham-on-Crouch/Sea Mammal Research Unit, Cambridge: Collaborative studies on organochlorine and heavy metal levels in cetaceans, seals, and otters.

MAFF Veterinary Investigation Unit, Polwhele/SAS Veterinary College, Inverness/Veterinary Department, Liverpool University/Sea Mammal Research Unit, Cambridge: Collaborative study of parasites of seals around the British Isles.

Marwell Zoological Park Hants and Thrigby Hall Wildlife Centre, Norfolk: Research projects on captive breeding and AI.

Ministry of Agriculture, Food and Fisheries: Collaborative studies on the development of reproductive technologies in alternative agricultural species.

Moshi Hospital, Tanzania: Malaria research.

MRC Unit of Experimental Embryology and Teratology, St George's Hospital Medical School, Tooting: Collaborative studies on mouse sperm freezing and embryo transfer.

National Avian Research Centre, United Arab Emirates: Collaborative studies of Bustard management & nutrition; collaborative project on molecular phylogeny of Bustards.

National Institute of Health, Islamabad, Pakistan: Surveillance of human and canine leishmaniasis.

Natural History Museum, London: Parasites of captive and free-living wild animals; collaborative studies on the life history and parasitology of cetaceans; Parasitic infections of wild animals.

Nature Conservation Bureau Ltd, Newberry: Management and veterinary care of Bustards; collaborative project on molecular phylogeny of Bustards.

Open University: Collaborative studies on Peafowl.

Queen Mary and Westfield College, London: Dynamics of long bone growth.

Queens University, Belfast: Collaboration on trout population genetics.

Reading University (Department of Microbiology): Studies of spongiform encephalopathy in zoo ungulates.

Royal Free Hospital, London: Toxocara diagnosis; Comparative anatomy of the appendix, inflammatory bowel disease of primates.

Royal Holloway and Beford New College: Mortality of the common dormouse; diseases of the European hedgehog.

Royal Society for the Protection of Birds: Health assessment of red kites for reintroduction, advice on avian diseases.

Royal Veterinary College, London: Collaborative studies on the sexual development of marsupials.

RSPCA Wildlife Hospital, Norfolk/SAC Veterinary Investigation Centre, Inverness/MAFF Veterinary Investigation Unit, Polwhele/BREMA Laboratory, Simferopol, Crimea, Ukraine/Dyfed Wildlife Trust/University of Cork (Zoology Department)/University of Liverpool (Department of Pathology): Collaborative studies on the pathology of cetaceans and seals.

St Mary's Hospital: Retrovirus infections of primates; Retroviral infection of wild animals; papillomatosis of captive wild animals.

Saratov Regional Authority, Russia: Joint programme for conservation of Great Bustard.

Sea Mammal Research Unit, Cambridge: Collaborative studies on gene flow in geographically structured seal populations/on the life history of the harbour porpoise.

Sense and Vision Electronic Systems Ltd. Sheffield: Collaborative development of computerised sperm mobility assessment system JSR Heathbred Ltd. Thorpe Willoughby, Yorks. Studies on boar spermatozoa.

Shanks & McEwan (Southern) Ltd: Collaborative botulism research.

State Institute for Public Health and Environment, Bilthoven/State University of Utrecht/Veterinary Research Laboratories, Stormont: Collaborative studies on virus diseases in cetaceans and seals.

Statens Bakteriologiska Laboratorium, Stockholm, Sweden: Serological diagnosis in Somalia.

Tshabalala Wildlife Sanctuary, Department of National Parks and Wildlife Management, Zimbabwe: Joint funding in Rhino Rescue.

Thrigby Hall Wildlife Centre, Norfolk: Research projects on captive breeding and AI.

University of Aberdeen: Collaborative research on *Lyme borreliosis* in Red Deer; *(Department of Zoology):* Collaborative study on population genetics of *Pipistrellus pipistrellus.*

University of Birmingham: Collaborative research on the evolutionary physiology of Tamm-Horsefall protein.

University of Bradford (Department of Biomedical Sciences): Collaborative studies on the endocrine control of hair growth in seasonal mammals.

University of Bristol (Department of Zoology): Collaborative research on population genetics of *Pipistrellus pipistrellus.*

University of Cambridge (Zoology Department): Collaborative study on the role of parasites in the population dynamics of Soay sheep on St Kilda; collaborative study on Patagonian Cavy.

University of Cape Town (Department of Zoology): Collaborative studies on the reproductive physiology and molecular genetics of African Mole-rats.

University College, London: Collaborative studies on Chemical Pathology and reproductive biology.

University of East London: Protozoal infections of reptiles and invertebrates.

University of Oxford (Department of Zoology): Collaborative study on mortality in harbour porpoise populations: Puffinosis in Manx shearwaters.

University of Southampton (Department of Biology): Collaborative study on the parasitological examination of formalin-fixed cetacean tissues.

University of Stockholm, Sweden: Collaborative study on trout genetics.

University of Virginia, Charlottesville, USA (Department of Biology): Collaborative studies on biological clocks.

WHO Centre for Echinococcosis/Hydatidoses: Collaborative project on the prefalence of *Echinococcus granulosus* in Uruguay.

Zimbabwe Department of National Parks and Wild Life Management: Joint funding of mechanic Paul Oleszczuk, Rhino Rescue.

Representation on Scientific Societies, Zoological, Conservation and Research Organisations

Animal Welfare: Dr M A Edwards (Advisory Editor)

Anthropoid Ape Advisory Panel: Dr J K Kirkwood (Member Scientific Committee).

Bibliography of Reproduction: Dr H Shaw; Dr A Loudon (Board of Management).

British Andrology Society: Dr W V Holt (Honorary Secretary).

British Veterinary Zoological Society: Dr J K Kirkwood (Member of Council); Mr A A Cunningham (Council Member).

British Wildlife Rehabilitation Council: Dr J K Kirkwood (Treasurer).

Department of the Environment: Dr J K Kirkwood (Part 1 of Secretary of State's List of Inspectors under the Zoo Licensing Act); A M Dixon (Member of Bio-Diversity Advisory Group).

European Cetacean Society: Mr T Kuiken (Member, Pathology Working Group).

Foundation for Research, Science and Technology, New Zealand: Dr A Loudon (Member of the International Advisory Panel).

Government of Brunei (Batang Duri Zoo): Douglas Richardson (Adviser on Zoo Management).

Institute of Fisheries Management: Dr H Hall (Member).

Ghana Game & Wildlife Department: N B D Lindsay (Adviser to Zoo Committee).

International Endocrine Services: Monitoring, with European zoos, endocrine cycles of exotic species, particularly captive elephants.

International Society of Andrology: Dr W V Holt (Committee on the International Status of Andrology).

International Union for Conservation of Nature and Natural Resources (Species Survival Commission): Mr A A Cunningham (Member, Captive Breeding Specialist, Invertebrate Group; Member, Pathology Working Group, Declining Amphibian Populations Task Force); Dr E J Flach (Member); Dr J K Kirkwood (Member, Veterinary Group); N B D Lindsay (Reintroduction of Insectivore Specialist Group).

Joint Management of Species Group Committee: Gerald Asher (Member, UK Bovid TAG); John Buchan (Member, UK Felid TAG); Mick Carman (Member, UK Primate TAG; EEP Primate TAG); Sarah Christie (Corresponding member, UK Primate TAG; UK Felid TAG; UK Bovid TAG; EEP Felid TAG; EEP Marsupial TAG; EEP Bovid TAG; EEP Primate TAG); Linda Davolls (Member, UK Primate TAG); Malcolm Fitzpatrick (Member, UK Small Carnivore TAG); Jo Gipps (Member, JMSC, UK Primate TAG; EEP Primate TAG); Paul Harrington (Member UK Touraco TAG); John Pullen (Member, UK Primate TAG); Douglas Richardson (Member, UK Felid TAG; EEP Felid TAG; EEP Hornbill TAG); Dave Risley (UK Reptile TAG); Fred Smith (Member, Penguin TAG); Mike Tiley (Member, UK Parrot TAG); Frank Wheeler (Member, UK Small Carnivore TAG).

Joint RSPCA/UFAW/FRAME/BVA Workshops on Refinement: A W Sainsbury (Member, Housing Rabbits Group).

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

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

Journal of Comparative Pathology: Dr G R Smith (Chief Editor).

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

Linnean Society of London: Dr M A Edwards (Editorial and Programme Committees).

Medicina: Dr A Voller (Editorial Board).

National Avian Research Center, United Arab Emirates: Dr J K Kirkwood (Scientific Panel).

ational Federation of Zoological Gardens of Great Britain & Ireland: N B D Lindsay (Conservation and Animal Management Committee).
ational Marine Mammal Research Steering Group: Mr T Kuiken (Member).
imate Society of Great Britain: A W Sainsbury (Member Council; Captive Care Working Party).
rogramme for Appropriate Technology in Health (PATH): Dr A Voller (Technical Advisory Group).
Helena Group: Paul Pearce Kelly (Chair).
ottish Strandings Liaison Group: Mr T Kuiken (Member).
matran Tiger PHVA and Captive Breeding Workshop, Indonesia: Sarah Christie; Douglas Richardson.
openmedizin und Parasitologie: Dr A Voller (Editorial Board).
niversities Federation for Animal Welfare: Dr M A Edwards (Council member).
niversity of Bristol: Dr J K Kirkwood (Visiting Lecturer, Departments of Medicine and Animal Husbandry).
niversity of Glasgow: Mr A A Cunningham (Visiting Lecturer, Department of Veterinary Pathology).
niversity of Kent: Dr J K Kirkwood (Visiting Lecturer, Durrell Institute of Conservation and Ecology).
niversity of London: Dr R Abayasekara, Dr B Brinkow, Dr C Faulkes, Dr W V Holt, Dr H Jabbour, Dr A Moore and Dr G Webley (Course Lecturers and Honorary Research Fellows, Department of Biology, University College, London); Dr B Brinkow; Dr C Faulkes; Dr H Jabbour (Course Lecturer in an Inter-Collegiate course on Reproductive Biology, King's College, London); Mr A A Cunningham (Visiting Lecturer, Department of Pathology, Royal Veterinary College); Dr F Gulland (Visiting Lecturer, Royal Veterinary College); Dr W V Holt (Course Lecturer, Royal Veterinary College, London); Dr J K Kirkwood (Board of Studies, Royal Veterinary College); Dr A Loudon (Course Co-ordinator and Honorary Research Professor, Department of Biology, University College, London); Dr G R Smith (Visiting Lecturer, Department of Pathology, Royal Veterinary College); Dr A Voller (Reader in Immunology of Parasitic Diseases, London School of Hygiene and Tropical Medicine).
University of Nottingham: Dr A Loudon (Visiting Lecturer, Sutton Bonnington).
Vaccine: Dr A Voller (Editorial Board).
Veterinary Invertebrate Society: Mr A A Cunningham (Secretary).
Veterinary Research Club: Dr G R Smith (President)
Wildlife Disease Association, European Section: Mr T Kuiken (Secretary).
World Association of Wildlife Veterinarians: A W Sainsbury (Secretary).
World Health Organisation: Dr A Voller (Member, Expert Advisory Panel on Parasitology; Member, WHO/IUIS Sub-committee on Standardization of Reagents for Enzyme Immunoassays).
World Society for the Protection of Animals: A W Sainsbury (Member, Scientific Advisory Panel).
Zebra Foundation for Veterinary Zoological Education: Dr J Kirkwood (Director and Trustee).

AMENDMENTS TO THE REGULATIONS

The following amended Regulations, effective from 1 January 1993, were made by Council pursuant to the power granted in Article 8 of the Charter:

ENTRANCE FEES AND SUBSCRIPTIONS

7 £10 out of the annual subscription of £50 shall be remitted in the case of Ordinary Fellows resident within the British Isles but outside a radius of 50 miles from Charing Cross.

8 £20 out of the annual subscription of £70 shall be remitted in the case of a Scientific Fellow who does not wish to receive the *Journal of Zoology*.

9 £5 out of the annual subscription of £40 shall be remitted in the case of Associates resident within the British Isles but outside a radius of 50 miles from Charing Cross, save for those Associates who qualify for student remission under Regulation 6 (vi) for whom £15 shall be remitted.

12 Overseas List

(i) An Ordinary Fellow who is resident outside the British Isles at the time of his election shall be registered on the Overseas List, in which case £25 out of the annual subscription of £50 shall be remitted.

(ii) An Ordinary Fellow who takes up residence outside the British Isles after election or intends at any time to reside outside the British Isles for a period of more than twelve months shall be transferred to the Overseas List. During his residence abroad, £25 out of the annual subscription of £50 shall be remitted, except in respect of the year in which he leaves the British Isles.

(iii) A Scientific Fellow who is resident outside the British Isles at the time of his election shall be registered on the Overseas List. If he does not wish to receive the *Journal of Zoology*, £45 out of the annual subscription of £70 shall be remitted.

(iv) A Scientific Fellow who takes up residence outside the British Isles after election or intends at any time to reside outside the British Isles for a period of more than twelve months shall be transferred to the Overseas List. If he does not wish to receive the *Journal of Zoology* during his residence abroad, £45 out of the annual subscription of £70 shall be remitted, except in respect of the year in which he leaves the British Isles.

(v) An Associate who is resident outside the British Isles at the time of his election shall be registered on the Overseas List, in which case £15 out of the annual subscription of £40 shall be remitted.

(vi) An Associate who takes up residence outside the British Isles after election or intends at any time to reside outside the British Isles for a period of more than twelve months shall be transferred to the Overseas List. During his residence abroad £15 out of the annual subscription of £40 shall be remitted except in respect of the year in which he leaves the British Isles.

13 Life Fellows

The following life composition fees shall be payable by any Fellow who wishes to compound his future subscriptions:

Age group	18–29	30–39	40–49	50–59	60 years and over
	£1205	£1100	£965	£800	£410

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

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

Life Associates

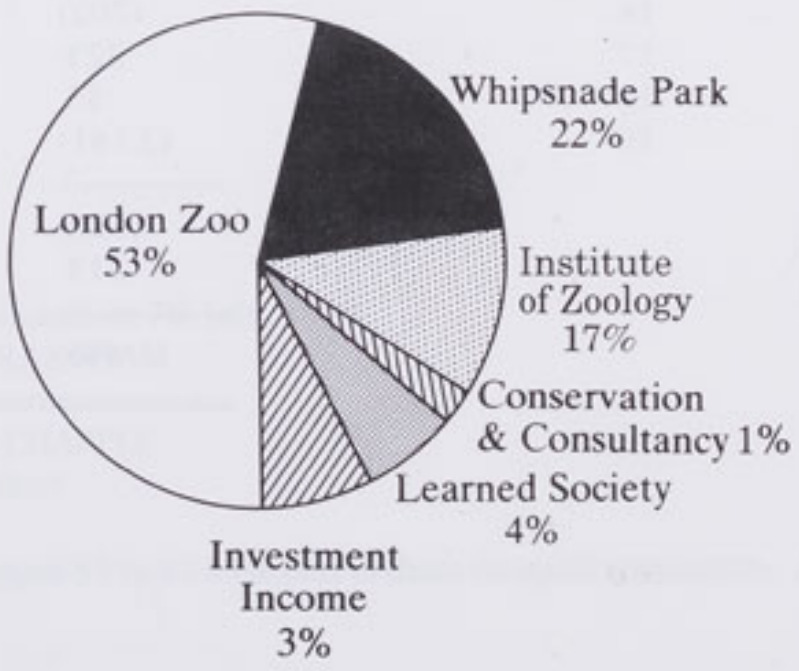
The following life composition fees shall be payable by any Associate who wishes to compound his future subscriptions:

Age group	18–29	30–39	40–49	50–59	60 years and over
	£1000	£915	£805	£665	£345

TREASURER'S REPORT

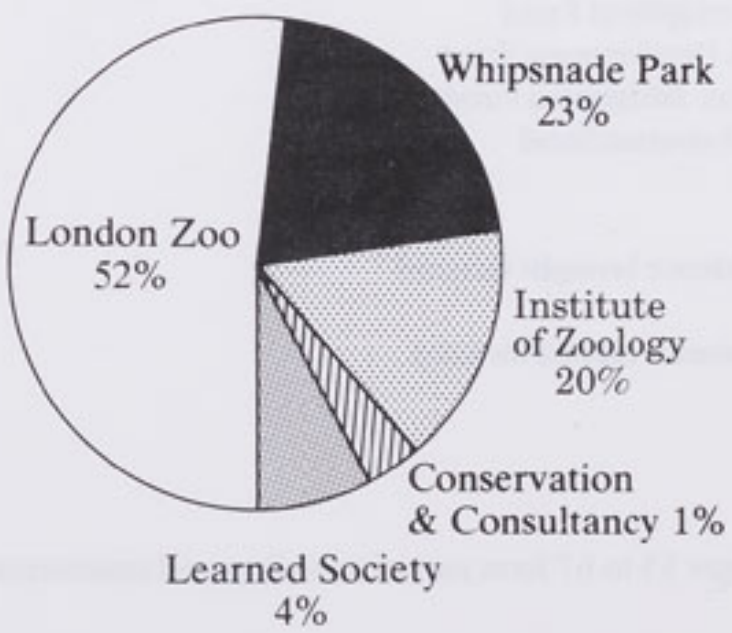
1. The process begun by my predecessor is continuing to re-establish and maintain the financial viability of the Society without receipt of revenue grants from the Government.
2. Despite swingeing cuts in operating costs in the winter of 1991/92, the forecast visitor numbers for 1992/93 at both Zoos proved to be optimistic and as a consequence the closure of London Zoo seemed inevitable. Ironically the decision to close London Zoo generated a surge in visitors so that a forecast loss of approximately £500,000 was turned around into a surplus of £156,000. Our plight also led to the Emir of Kuwait's most generous gift of £1 million.
3. I am relieved to report that the Society as a whole broke even in 1992/93; a small surplus of £32,000 as compared with a deficit last year of just under £2m.
4. The 1992/93 Accounts show that whilst we were able to maintain total income at the previous year's level of £14,716,000, expenditure was reduced by £2 million to £14,684,000. In the Balance Sheet, the provision made last year for the costs of closure of London Zoo has been reversed; considerably strengthening our Funds, which stood at £10,148,000. £5,462,000 of our Funds had been spent on new exhibits and other fixed assets over a number of years, and £977,000 had been invested in a portfolio of shares mainly held by the Scientific Fund. Working capital amounted to £3,709,000.
5. The total number of visitors to both Zoos was down by 12% over the corresponding financial year. Expressed on a calendar year basis, 16% fewer visitors came to both Zoos in 1992 (a decrease at London of 16%, a decrease at Whipsnade of 17%) as compared with 1991. Our Lifewatch Membership and Animal Adoption Scheme, whilst experiencing a set back at London Zoo, grew substantially at Whipsnade Park.
6. I would particularly like to acknowledge the response by our staff who have played such a full part in finding the essential cuts in costs. At this difficult time for the Society, it has been particularly welcome that our Volunteers have given so much time and effort alongside our full-time staff. The Society also wishes to express its thanks to all those who contributed to the Society by way of grants for purchasing fixed assets, numerous research funding grants and individual legacies and donations.
7. As the Society moves from survival to revival much yet needs to be done. Attendance figures in the first quarter of this financial year at London and Whipsnade are lower than budget and measures have been taken to reduce expenditure again. Many uncertainties remain, not least the recession and how to attract more visitors.

INCOME ANALYSIS 92/93



Total £14.72 million

EXPENDITURE ANALYSIS 92/93



Total £14.68 million

PETER WRANGHAM
Treasurer

FINANCIAL STATEMENTS

Consolidated Revenue Account for the year ended 31st March 1993

	Note	Year ended 31st March 1993 £'000s	Year ended 31st March 1992 £'000s
Income	2	14,231	14,097
Expenditure	2	14,684	16,618
Operating deficit for the year	3	(453)	(2,521)
Income from investments	5	187	82
Interest receivable	6	298	465
		485	547
Surplus/(Deficit) for the year		32	(1,974)
Exceptional items			
Grants for purchasing fixed assets:			
Emir of Kuwait		1,000	—
Other		165	724
		1,165	724
(Deficit)/surplus on sale of assets		(7)	70
Restructuring credit/(charge)	7	62	(839)
		1,252	(2,019)
Extraordinary item			
Curtailment credit/(charge)	8	1,254	(1,254)
Excess of income over expenditure/ (expenditure over income)		2,506	(3,273)
Appropriations from/(to) specific funds			
(To)/from Development Fund	16	(702)	118
From/(to) ZSL Development Trust	17	223	(441)
From/(to) Other Designated Funds	18	35	(10)
(To)/from Endowment Fund	19	(2,181)	3,263
		(119)	(343)
General Fund balance brought forward		615	958
General Fund balance carried forward		496	615

The notes on pages 55 to 67 form part of these financial statements.

Consolidated Balance Sheet as at 31st March 1993

	Note	£'000s	1993 £'000s	1992 £'000s
Fixed assets				
Tangible assets	9		5,462	2,487
Investments	10		977	1,003
			6,439	3,490
Current assets				
Stocks	11	421		546
Debtors	12	824		924
Cash at bank and in hand		4,468		2,294
		5,713		3,764
Creditors: amounts falling due within one year	13	(2,004)		(2,596)
Net current assets			3,709	1,168
Total assets less current liabilities			10,148	4,658
Creditors: amounts falling due after more than one year	14		—	(12)
			10,148	4,646
Funds	15			
Development	16		4,790	1,092
ZSL Development Trust	17		478	701
Other Designated	18		1,071	1,106
Endowment	19		3,313	1,132
General			496	615
			10,148	4,646

Approved by Council on 7th July, 1993

PETER WRANGHAM
Treasurer

SIR JOHN CHAPPLE
President

The notes on pages 55 to 67 form part of these financial statements.

Consolidated Cash Flow Statement for the year ended 31st March 1993

	Note	£'000s	1993 £'000s	1992 £'000s
Net cash inflow/(outflow) from operating activities	24		1,844	(3,059)
Returns on investment and servicing of finance				
Interest received		275		465
Investment income		161		78
Interest element of finance leases		(8)		(7)
Bank interest paid		—		(1)
Net cash inflow from returns on investments and servicing of finance			428	535
Investing activities				
Purchase of fixed assets		(107)		(600)
Disposal of fixed assets		1		7
Purchase of investments		(274)		(750)
Sale of investments		294		746
Net cash outflow from investing activities			(86)	(597)
Net cash inflow/(outflow) before financing			2,186	(3,121)
Financing				
Capital element of finance leases		(12)		(14)
Net cash inflow/(outflow) from financing			(12)	(14)
Increase/(decrease) in cash and cash equivalents	25		2,174	(3,135)

The notes on pages 55 to 67 form part of these financial statements.

Report of the Auditors

TO THE COUNCIL OF THE ZOOLOGICAL SOCIETY OF LONDON

We have audited the financial statements on pages 52 to 67, which have been prepared under the historical cost convention as modified by the revaluation of certain fixed assets and on the basis of the accounting policies set out on pages 55 and 56.

Respective responsibilities of trustees and auditors

The Trustees of the Society are responsible for the preparation of financial statements for each financial year which give a true and fair view of the state of affairs of the Society and of its net income or deficit for the year. In preparing the financial statements, the Trustees are responsible for keeping proper accounting records which are able to show with reasonable accuracy, at any time, the financial position of the Society and to enable them to ensure that the financial statements comply with generally accepted accounting principles. The Trustees are also responsible for safeguarding the assets of the Society and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

It is our responsibility to form an independent opinion, based on our audit, on those financial statements and to report our opinion to you.

Basis of opinion

We conducted our audit in accordance with Auditing Standards issued by the Auditing Practices Board. An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures in the financial statements. It also includes an assessment of the significant estimates and judgements made by the trustees in the preparation of the financial statements, and of whether the accounting policies are appropriate to the Society's circumstances, consistently applied and adequately disclosed.

We planned and performed our audit so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error. In forming our opinion we also evaluated the overall adequacy of the presentation of information in the financial statements.

Fundamental uncertainty

In forming our opinion, we have considered the adequacy of the disclosure made in the financial statements concerning the level of financial resources available to the Society to continue its usual operations. The financial statements have been prepared on a going concern basis, the validity of which depends upon future funding being available. The Society suffered significant deficits for many years, but achieved a small surplus this year. Significant assurance is not present to indicate that the Society will continue to operate profitably and this could result in it not having adequate resources to fund its usual operations. The financial statements do not include any adjustments that would result from a failure to continue to operate profitably and obtain adequate funding. Details of the circumstances relating to this fundamental uncertainty are described in note 1(c). Our opinion is not qualified in this respect.

Opinion

In our opinion the financial statements give a true and fair view of the state of the Society's affairs as at 31st March, 1993 and of the excess of income over expenditure for the year then ended.

ERNST & YOUNG
Chartered Accountants
Registered Auditor
London
7th July, 1993

Notes to the Financial Statements

1. ACCOUNTING POLICIES

(a) *Accounting Convention*
The financial statements are prepared under the historical cost convention and in accordance with applicable accounting standards.

(b) *Changes in Accounting Policies*
The Society changed its accounting policy for fixed assets and depreciation to that stated below from January 1984. Freehold land and buildings acquired prior to December 1983 are fully depreciated; other buildings, plant, vehicles and fittings and furnishings were written off in the year of purchase.

(c) *Basis of Financial Statements*
The financial statements have been prepared on a going concern basis. The validity of this assumption depends on future funds being available to the Society to continue its usual operations. The Society has suffered significant deficits for many years, but has achieved

a small surplus this year. The appropriateness of the going concern basis is dependent upon the Society continuing to operate profitably and having adequate resources to meet its lease obligations as referred to in Note 22.

(d) *Consolidation*

The financial statements consolidate the results and the assets and liabilities of the Society's wholly owned subsidiaries Zoo Operations Limited, Zoo Enterprises Limited, Zoo Restaurants Limited and Whipsnade Wild Animal Park Limited as well as the Zoological Society of London Development Trust for which the Council appoints the Trustees. Zoo Operations Limited ceased to trade on 30th September 1992. From 1st October 1992 Zoo Enterprises Limited and Whipsnade Wild Animal Park Limited undertook the trading activities at the Zoological Gardens at London Zoo and Whipsnade Wild Animal Park respectively. Zoo Restaurants Limited remained dormant.

(e) *Form of Financial Statements*

The Society maintains a number of internal funds earmarked by the Society itself for specific purposes. These designated funds are:

(i) Development Fund: This fund relates to expenditure incurred on new buildings, the restoration of existing buildings and changes to the infrastructure of the Society's properties carried out to improve the facilities available to the animals and staff and to the visiting public. It is wholly financed from donations and grants received from the public which in certain circumstances have been matched by grants from the Government. The donations and grants are released back to revenue over the expected useful life of the relevant tangible asset by equal annual instalments.

(ii) ZSL Development Trust: The Zoological Society of London Development Trust is a separately constituted Trust with charitable status whose Trustees are appointed by the Council of the Society. Its purpose is to raise funds to meet expenditure on new buildings, the restoration of existing buildings and changes to the infrastructure of the Society's properties.

(iii) Other designated funds: These have been given or bequeathed to the Society to be used in accordance with resolutions passed by the Council of the Society. Both the capital and the income may be spent. Until they are spent, the funds are invested in stocks, shares and deposits.

(iv) Endowment Fund: This fund was created from a grant received from the Department of the Environment. The capital and income are available to help pay for the upkeep, improvement and management of the Zoological Gardens at London Zoo and Whipsnade Wild Animal Park.

(v) General Fund: The General Fund is the free fund of the Society. It has to provide for the maintenance, improvement and management of the Institute of Zoology, Conservation and Consultancy projects, Publications, Library and membership administration as well as for the Society's requirement for working capital.

(f) *Restricted Funds*

Restricted funds of the Society which have conditions attached to their use are not included in the balance sheet. Details of these are set out in Note 20.

(g) *Grants*

Government grants received of a revenue nature are credited to the General Fund in the year in which they are received. Grants received of a capital nature are credited to the revenue account and then appropriated to the appropriate designated fund and are released to revenue over the expected useful life of the relevant assets by equal annual amounts.

(h) *Income from donations*

All donations are initially accounted for on a cash received basis. Where a donation is received for a specific purpose, the income is deferred and included within accruals and deferred income. It is then credited to the revenue account over the period for which the related costs are charged.

(i) *Fixed Assets and Depreciation*

Fixed assets acquired by purchase or gift during the year are shown at cost or valuation depreciated on a straight line basis at rates appropriate to write off the cost over their expected useful lives. Freehold and leasehold buildings are depreciated over a range of 1 to 30 years; plant and equipment 5 to 15 years and motor vehicles 5 years.

(j) *Investments and Investment Income*

Listed investments are included in the balance sheet at the lower of cost and market value. Dividends and interest are accounted for when the cash is received. The amount shown includes the related tax credits which, because of the Society's charitable status, are recoverable. Interest on bank deposits is accounted for on an accruals basis.

(k) *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 and garden stocks and the library; stocks of scientific publications are included at nominal valuation.

(l) *Advertising Costs*

Costs incurred in relation to advertising are charged to the revenue account at the time the advertisements appear in the media or are otherwise made public. Amounts invoiced but not yet taken to the revenue account are included in prepayments and accrued income.

(m) *Pension Costs*

The cost of providing pension benefits is charged to the revenue account over the period benefiting from employees' services.

(n) *Leasing Commitments*

Assets obtained under finance leases are capitalised in the balance sheet and are depreciated over their useful lives. The interest element of the rental obligations is charged to the revenue account over the period of the lease and represents a constant proportion of the balance of capital repayments outstanding.

2. DETAILED CONSOLIDATED REVENUE ACCOUNT FOR THE YEAR ENDED 31st MARCH 1993

Divisions	Note	Income £'000s	Expenditure £'000s	1993 Surplus/ (Deficit) £'000s	1992 Surplus/ (Deficit) £'000s
Zoological Gardens					
London Zoo	2(a)	7,790	7,634	156	(1,215)
Whipsnade Park	2(a)	3,203	3,367	(164)	(873)
Scientific					
Institute of Zoology	2(b)	2,760	2,915	(155)	(204)
Conservation & Consultancy	2(c)	94	110	(16)	—
Publications	2(d)	334	320	14	(27)
Library	2(e)	10	110	(100)	(93)
Learned Society	2(f)	227	223	4	3
Less:					
Scientific Fund transfer to Institute of Zoology		(182)	—	(182)	(77)
Lord Zuckerman Bursary Fund transfer to Institute of Zoology		(5)	—	(5)	—
Investment charges		—	5	(5)	(35)
Totals of income and expenditure		14,231	14,684		
Operating deficit for the year				(453)	(2,521)

(a) Zoological Gardens

	Note	London Zoo 1993 £'000s	London Zoo 1992 £'000s	Whipsnade Park 1993 £'000s	Whipsnade Park 1992 £'000s
Income					
Admission of visitors		3,711	3,714	1,505	1,558
Educational visits		155	153	90	53
Admission of cars to Park		—	—	167	191
Car Parking at Zoo		180	170	—	—
Catering and Shops	2(g)	3,344	3,802	1,050	1,170
Animal rides		32	59	—	—
Steam train		—	—	112	71
Lifewatch scheme		90	104	135	73
Consultancy		—	18	—	—
Other		278	105	144	67
		7,790	8,125	3,203	3,183
Expenditure					
Cost of goods sold		1,254	1,444	445	493
Staff costs		3,453	4,042	1,588	1,652
Provisions		158	255	193	228
Less:					
Income from animal adoption scheme		(76)	(88)	(39)	(22)
Works		46	139	130	191
Gardening and Grounds		13	25	12	8
Utilities and other overheads		1,590	1,866	411	652
Publicity and advertising		530	726	468	572
Backlog maintenance		99	147	—	5
Administration		465	518	63	181
Depreciation		69	64	83	84
		7,601	9,138	3,354	4,044
Surplus/(Deficit) in operating divisions		189	(1,013)	(151)	(861)
Overheads		(4)	153	4	—
Depreciation		567	669	234	235
Release from Development Fund		(530)	(386)	(225)	(130)
Release from Endowment Fund (see Note 15)		—	(234)	—	(93)
(Deficit) in Society		(33)	(202)	(13)	(12)
Operating Surplus/(Deficit)		156	(1,215)	(164)	(873)

(b) **Institute of Zoology**

	Veterinary Science	Wellcome Laboratories	Nuffield Laboratories	1993 Total	1992 Total
	£'000s	£'000s	£'000s	£'000s	£'000s
Income					
Fees and Donations	82	27	10	119	42
Transfers from:					
Scientific Fund (see Note 18)	72	43	67	182	77
Lord Zuckerman Bursary (see Note 18)	5	—	—	5	—
Grants					
Government Grant	266	370	830	1,466	1,463
Specific projects	80	284	624	988	819
	505	724	1,531	2,760	2,401
Expenditure					
Staff costs	363	473	1,016	1,852	1,581
Overheads	189	206	439	834	802
Administration	39	40	92	171	166
Depreciation	4	25	31	60	58
Release from Development Fund	—	(1)	(1)	(2)	(2)
	595	743	1,577	2,915	2,605
Operating (Deficit)	(90)	(19)	(46)	(155)	(204)

(c) **Conservation & Consultancy**

	1993 £'000s	1992 £'000s
Income – fees	94	—
Expenditure		
Staff Costs	83	—
Overheads	17	—
Administration	10	—
	110	—
Operating (Deficit)	(16)	—

(d) **Publications**

	Journal of Zoology, Symposia	International Zoo Year Book	1993 Total	1992 Total
	£'000s	£'000s	£'000s	£'000s
Income				
Sales	240	94	334	321
Expenditure				
Staff costs	101	54	155	169
Overheads	10	4	14	17
Printing	112	19	131	145
Administration	14	6	20	17
	237	83	320	348
Operating Surplus/(Deficit)	3	11	14	(27)

International Zoo Year Book: Fixed costs are written off in the year in which they are incurred. Paper and printing costs are charged in the year in which each volume is published.

Zoological Record and *Nomenclator Zoologicus:* The deficit for the year was £375 (1992–£26,354).

(e) Library

	1993 £'000s	1992 £'000s
Income	10	1
Expenditure		
Staff costs	50	67
Overheads	39	19
Administration	21	8
	110	94
Operating (Deficit)	(100)	(93)

(f) Learned Society

	1993 £'000s	1992 £'000s
Income		
Members' subscriptions and fees	120	108
Donations	102	31
Symposium	5	4
	227	143
Expenditure		
Staff costs	18	18
Symposium costs	13	12
Overheads	151	103
Investment charges transferred to Scientific Fund	—	(29)
Administration	41	36
	223	140
Operating Surplus	4	3

(g) Catering and Shops

The turnover and net contribution to the Society from Catering and Shops were as follows:

	London Zoo	Whipsnade Park	1993 Total	London Zoo	Whipsnade Park	1992 Total
	£'000s	£'000s	£'000s	£'000s	£'000s	£'000s
TURNOVER						
Catering	2,042	612	2,654	2,337	667	3,004
Shops	1,302	438	1,740	1,465	503	1,968
	3,344	1,050	4,394	3,802	1,170	4,972
CONTRIBUTION TO SOCIETY						
Catering	219	143	362	169	148	317
Shops	443	135	578	475	153	628
	662	278	940	644	301	945

3. OPERATING DEFICIT FOR THE YEAR

	1993 £'000s	1992 £'000s
Operating deficit is stated after charging/(crediting) the following items:		
Auditors remuneration	44	44
Depreciation of fixed assets	1,028	1,142
Release of Grants for purchasing fixed assets	(757)	(846)
Consultancy fees	71	34
Bank Interest payable	—	1
Finance charges on leased assets	8	7
Government Revenue Grant for the Institute of Zoology	(1,466)	(1,463)

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

4. STAFF COSTS

	1993 £'000s	1992 £'000s
Salaries and wages	5,711	6,188
Social security costs	497	574
Other pension costs	413	445
	6,621	7,207

The average weekly number of employees during the year was made up as follows:

	1993 Full Time	1993 Part Time	1992 Full Time	1992 Part Time
Zoological Gardens – London Zoo	120	29	156	50
– Whipsnade Park	75	15	85	23
Institute of Zoology	80	—	75	—
Conservation and Consultancy	2	2	—	—
Publications	6	—	8	—
Library	2	—	3	—
Learned Society	1	—	1	—
Administration	25	2	27	2
	311	48	355	75

5. INCOME FROM INVESTMENTS

	1993 £'000s	1992 £'000s
Listed investments	187	82

6. INTEREST RECEIVABLE

Bank deposits	298	465

7. RESTRUCTURING COSTS

Pension scheme	(216)	216
Other costs	154	623
Net (credit)/charge	(62)	839

The restructuring charge for the year ended 31st March 1992 included the cost of providing augmented pensions to those members of the Zoological Society of London 1988 Pension Scheme who had been declared redundant. The Trustees of the Scheme subsequently resolved to waive the contribution and the sum was repaid during the year ended 31st March 1993. Other costs includes auditors' remuneration for non-audit services of £15,500 (1992–£19,500).

8. CURTAILMENT COSTS

	1993 £'000s	1992 £'000s
A provision was made at 31st March 1992 for the estimated costs that would have arisen on the closure of London Zoo. The amount included provision for statutory redundancy payments, and liabilities for the early termination of contracts. Following the subsequent decision to rescind the closure announced on 17th June 1992, this provision has been reversed.	(1,110)	1,110
Provision for permanent diminution in value of fixed assets at London Zoo written back	(3,897)	3,897
Release of Grants for purchasing fixed assets written back	3,753	(3,753)
Net (Credit)/Charge	(1,254)	1,254

9. TANGIBLE FIXED ASSETS

	Freehold land and buildings	Short leasehold buildings	Plant and equipment	Motor vehicles	Leased plant	Total
	£'000s	£'000s	£'000s	£'000s	£'000s	£'000s
Cost						
At 31st March 1992	2,259	5,270	2,159	387	91	10,166
Purchased during the year	22	46	33	6	—	107
Disposals	—	—	—	(23)	—	(23)
At 31st March 1993	2,281	5,316	2,192	370	91	10,250
Depreciation						
At 31st March 1992	591	5,239	1,505	308	36	7,679
Charge for the year	218	447	311	41	11	1,028
Permanent diminution in value written back	—	(3,480)	(417)	—	—	(3,897)
Disposals	—	—	—	(22)	—	(22)
At 31st March 1993	809	2,206	1,399	327	47	4,788
Net book value						
At 31st March 1993	1,472	3,110	793	43	44	5,462
At 31st March 1992	1,668	31	654	79	55	2,487

Included in additions during the year is £29,024 (1991/92 – £495,503) incurred by the Endowment Fund and £67,646 (1991/92 – £36,839) incurred by the Development Fund.

10. INVESTMENTS

	1993 £'000s	1992 £'000s
Investments stated at the lower of cost and market value		
Quoted investments	977	1,003
Market valuation at 31st March 1993	1,340	1,203
These investments are attributed to:		
Scientific Fund	1,315	1,180
Fantham Bequest	25	23
	1,340	1,203

	1993 £'000s	1992 £'000s
11. STOCKS		
Raw materials and consumables	114	128
Finished goods and goods for resale	307	418
	421	546
12. DEBTORS		
Trade	117	213
Other debtors	368	600
Prepayments and accrued income	339	111
	824	924
13. CREDITORS: amounts falling due within one year		
Trade	662	393
VAT	10	3
PAYE and National Insurance contributions	194	152
Other creditors	322	406
Accruals and deferred income	816	532
Curtailment Costs (see Note 8)	—	1,110
	2,004	2,596
14. CREDITORS: amounts falling due after more than one year		
Finance lease obligations	—	12

15. FUNDS

The Society has designated five main funds in order to present more clearly the inflows of funds received for capital development purposes and from the Government. It has been decided to combine the former Building and Equipment Fund with the Development Fund. In addition, the ZSL Development Trust is included in the accounts (see Note 1(e),(ii)). The consequent restatement of the Funds at 31st March 1992 is set out below.

Funds per 1992 Accounts:	
Development	701
Building & Equipment	391
1992 Accounts total restated	1,092

In addition, this year, it was considered more appropriate to transfer into the Development Fund the amount of the Endowment Fund invested in fixed assets which have been financed by Grants.

16. DEVELOPMENT FUND

	1993 £'000s	1992 £'000s
Balance at 31st March 1992	1,092	4,612
Release of Grants for purchasing fixed assets	(757)	(519)
Release of Grants for permanent diminution in value of fixed assets at London Zoo	3,753	(2,883)
Grants for purchasing fixed assets	(14)	25
Transfer of fixed assets from Endowment Fund (see Note 15)	716	1
Transfer to General Fund	—	(144)
Being appropriation from/(to) Revenue Account	702	(118)
Balance at 31st March 1993	4,790	1,092

The Development Fund was wholly invested in fixed assets.

17. ZSL DEVELOPMENT TRUST

Balance at 31st March 1992	701	260
Interest receivable	52	59
Grants for purchasing assets, less donations paid	(275)	382
Being appropriation (to)/from Revenue Account	(223)	441
Balance at 31st March 1993	478	701

18. OTHER DESIGNATED FUNDS

	Fantham Bequest	Scientific Fund	Composition Fund	Staff Benevolent Fund	Lord Zuckerman Bursary Fund	Total
	£'000s	£'000s	£000's	£'000s	£'000s	£'000s
Balance at 31st March 1992	14	1,040	35	3	14	1,106
Investment income	1	161	1	—	1	164
(Deficit) on sale of investments	—	(7)	—	—	—	(7)
Transfer to Institute of Zoology (see Note 2(b))	—	(182)	—	—	(5)	(187)
Investment charges	—	(5)	—	—	—	(5)
Being appropriation from/(to) Revenue Account	1	(33)	1	—	(4)	(35)
Balance at 31st March 1993	15	1,007	36	3	10	1,071

In addition, the Heer Bequest balance at 31st March 1993 was £91 (1992–£91).

19. ENDOWMENT FUND

	1993 £'000s	1992 £'000s
Balance at 31st March 1992	1,132	5,592
Release of Grants for purchasing fixed assets	—	(327)
Release of Grants for permanent diminution in value of fixed assets at London Zoo	—	(870)
Grants for purchasing fixed assets	1,454	317
Interest receivable	235	154
Surplus/(Deficit) on Zoo Operations Ltd	1,679	(1,784)
(Deficit) Zoos Divisions	(1,640)	—
Transfer of fixed assets to Development Fund (see Note 15)	(716)	(1)
Transfer to General Fund	(3)	—
Restructuring Costs	62	(839)
Curtailment Costs (see Note 8)	1,110	(1,110)
Being appropriation from/(to) Revenue Account	2,181	(3,263)
Balance at 31st March 1993	3,313	1,132

20. RESTRICTED FUNDS

(a) De Arroyave Fund

The trusteeship of the Fund was transferred during the year from the Official Custodian for Charities to the Society. The receipt of income from the Fund continues to be conditional upon the Society fulfilling certain obligations. Net income was £23,015 (1992–£23,856).

(b) Davis Fund

The Fund is held in trust by the Society. Income from the Fund was £161 (1992–£161).

21. PENSION SCHEMES

The Society participates in several Pension Schemes and employees join the appropriate scheme, depending on their employment terms. The total pension cost of the Society was £413,452 (1991/92 £444,567).

(a) Universities Superannuation Scheme: This is a defined benefit scheme which is externally funded and contracted out of the State Earnings-Related Pension Scheme. The Fund is valued every three years by a professionally qualified independent actuary using the projected unit credit method, the rates of contribution payable being determined by the trustee on the advice of the actuary. In the intervening years, the actuary reviews the progress of the Scheme. Pension costs are assessed in accordance with the advice of the actuary, based on the latest actuarial valuation of the Scheme, and are accounted for on the basis of charging the cost of providing pensions over the period during which the Society benefits from the employees' services. Unless it is considered prudent to recognise deficiencies over a shorter period, variations from regular cost are spread over the expected average remaining working lifetime of Members of the Scheme after making suitable allowances for future withdrawals.

The Scheme provides benefits based on final pensionable salary for employees of all UK universities and some other employers such as the Society. The assets of the Scheme are held in a separate trustee-administered fund.

The latest actuarial valuation of the Scheme was at 31st March 1990. The main actuarial assumptions were an investment return of $8\frac{1}{2}\%$ per annum, salary scale increases of $6\frac{1}{2}\%$ per annum and that pensions would increase by 5% per annum.

At the date of the last actuarial valuation, the market value of the assets of the Scheme was £5,474 million and the actuarial value of the assets was sufficient to cover 90% of the benefits which had accrued to Members after allowing for the effect of future increases in their earnings. The level of contributions paid by the Society takes into account this actuarial deficiency.

(b) The Zoological Society 1988 Pension Scheme: The Society's own self-administered occupational pension Scheme is a non-contributory defined benefit scheme which is externally funded and is not contracted out of the State Earnings-Related Pension Scheme. The Scheme is valued every three years by a professionally qualified independent actuary using the attained age method. The Actuary confirms annually, based on a detailed knowledge of the affairs of the Scheme, that the conclusions reached at the last valuation date have not substantially altered. Payments made to the Scheme and charged in these financial statements are based upon actuarial advice. The assets of the Scheme are held in separate trustee-administered funds.

The latest actuarial valuation of the Scheme was at 30th June 1990. The main actuarial assumptions are an investment return of 9% per annum, salary increases would average 7% per annum and that pensions would increase by 4.5% per annum.

At the date of the latest actuarial valuation the market value of the assets was £7.3 million and the actuarial value of the assets exceeded the benefits that had accrued to members by 26%, after allowing for the effect of future increases in their earnings. Improvements to benefits have been made which have the effect of reducing the over-provision to a level acceptable to the Inland Revenue.

In the opinion of Council, on the recent advice of their actuaries, the present level of funding is adequate.

(c) Department of Education and Science: The Society contributes for one person to a pension scheme administered through the Department of Education and Science, for teachers employed by the Society during their period of service.

22. CAPITAL COMMITMENTS AND CONTINGENT LIABILITIES

No provision has been made for the significant potential liability for repairing obligations in connection with the Regent's Park lease. Initial surveys performed for the Department of National Heritage estimated that this obligation was £15 million. A more recent survey has valued these repairs at £7.75 million. The Department of National Heritage has agreed that this more recent survey is a suitable basis for determining the Society's repairing obligation.

The Society is currently negotiating the terms of a new lease which will include a programme of repairs agreed annually, to satisfy the above obligation. The Department of National Heritage has indicated that this programme will take into account the financial position of the Society.

23. FINANCE LEASE OBLIGATIONS

	1993 £'000s	1992 £'000s
Net amount payable:		
Next year	12	12
In the second to fifth years	—	12
	12	24

24. RECONCILIATION OF OPERATING RESULTS TO NET CASH OUTFLOW FROM OPERATING ACTIVITIES

Surplus/(deficit) for the year after exceptional items	1,252	(2,019)
Depreciation	1,028	1,142
Release of grants for purchasing fixed assets	(757)	(846)
Investment income	(187)	(82)
Interest received	(298)	(465)
Interest element of finance leases	8	7
Bank interest paid	—	1
Deficit/(surplus) on sale of assets	7	(70)
Decrease/(increase) in stocks	125	(29)
Decrease in debtors	148	501
Decrease in creditors	(592)	(89)
Provision for curtailment costs	1,110	(1,110)
Net cash inflow/(outflow) from operating activities	1,844	(3,059)

25. ANALYSIS OF CHANGES IN CASH AND CASH EQUIVALENTS DURING THE YEAR

Balance at 1st April 1992	2,294	5,429
Net cash outflow	2,174	(3,135)
Balance at 31st March 1993 (see note 26)	4,468	2,294

26. ANALYSIS OF THE BALANCES OF CASH AND CASH EQUIVALENTS AS SHOWN IN THE BALANCE SHEET

	1993 £'000s	1992 £'000s	Change in year £'000s
Cash at bank and in hand	4,468	2,294	2,174
	4,468	2,294	2,174

27. ANALYSIS OF CHANGES IN FINANCING DURING THE YEAR

	Specific Funds £'000s	Finance lease obligations £'000s
Balance at 1st April 1992	4,031	12
Bank interest	287	
Investment income	164	
Cash outflows from financing	—	(12)
Provision for curtailment costs	1,110	
Operating deficit	(101)	
Grants for purchasing fixed assets	1,165	
Release of grants for purchasing fixed assets	(757)	
Provision for permanent diminution in asset values written back	3,753	
Balance at 31st March 1993	9,652	—

28. STATUS OF THE SOCIETY

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

LEGACIES TO THE SOCIETY

The Zoological Society of London is a registered charity (Number: 208728) and all gifts to it are completely exempt from capital gains tax and capital transfer tax.

Please consider leaving the Society a legacy in your will. The Society's many educational and conservation activities depend on the generosity of its friends and benefactors. Its world famous collection of animals and the Institute of Zoology also need financial support. Unless income can be constantly increased, there is certain to be a reduction in what the Society can achieve. A legacy would be a very real help.

Further advice on legacies and how the Society may benefit can be obtained from The Secretary, Zoological Society of London, Regent's Park, London NW1 4RY.

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THE ZOOLOGICAL SOCIETY OF LONDON

ANNUAL REPORT 1991–1992

THE QUEEN'S VISIT: 9th MAY 1990

Programme

1. Welcomed at entrance to Barclay Court. 14.30

In attendance: President
Secretary
Treasurer
Managing Director
Director of Administration
Director of Science
Lord Mayor and Lady Mayoress of Westminster
Deputy Mayor and Mayoress of Camden

2. The Queen, accompanied by the President, will walk to the Elephant House via an avenue of local school children.

Duke accompanied by Secretary.

3. Elephant House. The Queen will be met by the Director of Zoos. 14.40

The Queen inaugurates the elephant tracking project.

In Attendance: Dr Sally Kosgei, High Commissioner to Kenya.
Mr Richard Leakey, Director of Kenya Wildlife Service.
Conservation Officer and Assistant to Director of Zoos.
Representatives of World Wide Fund for Nature
and sponsors of the elephant tracking project.

AT THIS POINT THE QUEEN AND THE DUKE HAVE SEPARATE PROGRAMMES.

THE QUEEN - accompanied throughout by President, Treasurer, and Director of Administration.

Q4. The Queen, accompanied by the Director of Zoos, walks through the Elephant Paddock and observes 3 elephants in bathing pool. 15.00

In Attendance: Curator of Mammals
Overseer, James
Head Keeper, Brian Harman.

Exit via bridge built by the Royal Anglian Regiment.

Q5. Inspect newly refurbished Penguin Pool and watch penguin feeding. 15.10

In Attendance: Curator of Birds
Overseer, Birds
Head Keeper
Mr Berthold Lubetkin (Architect) [in wheelchair]

Q6. Walk through the riding area to the Lifewatch Centre. 15.20

Q7. Accompanied by the Director of Marketing.

The Queen is invited to unveil a plaque: 'The Lifewatch Centre, Opened by HM The Queen, 9 May 1990.' 15.25

In Attendance: Public Affairs Officer

Q8. Queen to walk through the Lifewatch Centre and (briefly) view examples of conservation projects with which ZSL is associated.

Q9. Walk to small art exhibition reflecting winning entries in competition run for local schools with a conservation theme.

Q10. Enter Hummingbird Amphitheatre. Welcomed by Rolf Harris. 15.35

Present certificates in school competition and participated in "Meet the Animals".

Q11. Accompanied by the Chief Executive of Whipsnade walk to:

Q12. The Whipsnade Pavilion. View examples of work and developments at Whipsnade. 15.50

In Attendance: Animal Manager and Veterinary Officer
Marketing Manager
Operations Manager

Q13. Enter Regency Suite, welcomed by the Deputy Chairman of the Development Trust. 16.00

Q14. Take Tea with guests.

Q15. Sign: Visitors Book. 16.25
Photograph

Q16. Short speech from President.

President accompanies Queen to motor car.

Q17. Leave Zoo after formal farewells. 16.30

PRINCE PHILIP - accompanied throughout by Sir Barry Cross (Secretary) and the Director of Science.

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Oneida

P5.	On leaving Elephant House: Drive in Whipsnade Land Rover to Animal Hospital.	15.00
P6.	Inspect clinical facilities, brief display of haemotology and animal pens. **In Attendance:** Dr J Kirkwood Dr C Hawkey	15.05
P7.	Leave Hospital.	15.25
P8.	Walk across Outer Circle Road.	
P9.	Enter north side of Zoo (Cotton Terraces). **In Attendance:** Curator of Mammals Overseer, Kitchenside	15.30
P10.	Walk through Horse & Cattle House en route to:	
P11.	Enter Giraffe House.	15.35
P12.	Inspect display of genetic monitoring (including Partula Snails). **In Attendance:** Dr G Mace Assistant Curator, Aquarium and Insect House Head Keeper	
P13.	Leave Giraffe House.	15.45
P14.	Drive in Land Rover through West Tunnel to Sobell Pavilions.	15.50
P15.	Walk through Sobells to Whipsnade display.	16.00

REST OF PROGRAMME AS FOR THE QUEEN.

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VISIT