





THE ZOOLOGICAL SOCIETY OF LONDON

ANNUAL REPORT 1994 - 1995

This report covers the period from 1 April 1994 to 31 March 1995

The Council has pleasure in presenting its 166th Annual Report to the Annual General Meeting of the Society to be held on 20 September 1995 at 3.30 pm in the Society's Meeting Room at Regent's Park.

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MISSION STATEMENT

To promote the worldwide conservation of animals and their habitats by presenting outstanding living collections, breeding threatened species, increasing public awareness through information and education, conducting relevant research and undertaking action in the field.

The Society pursues this mission by:

1. keeping and presenting animals at London Zoo and Whipsnade Wild Animal Park in accordance with best practice;
2. giving priority to species that are threatened in the wild;
3. increasing public understanding of animals and their welfare and of the issues involved in their conservation;
4. maintaining an outstanding education and information programme, particularly for schoolchildren and families;
5. undertaking field conservation programmes, both in Britain and abroad;
6. developing its role as a leading centre for research on conservation biology and animal welfare;
7. fulfilling its role as a Learned Society and force for zoology and animal conservation through publications, scientific meetings, lectures, the award of prizes for outstanding achievement and the promotion of conservation policy.

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. New Charters were issued in 1963 and 1995.

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 for 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 1960s) 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 currently 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.

Meetings held each year include eight Scientific Meetings, at which the results of new research are communicated and discussed; one or two Symposia on special subjects of international interest, which generally occupy two days of contributions and discussions; and monthly evening lectures on subjects of general zoological or conservation interest.

The Society's publications include: the *Journal of Zoology*, which publishes original research in all fields of zoology, from international contributors, its wide variety of contents providing 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 *Nomenclator Zoologicus*, a continuous record of the bibliographical origins of the name of every genus and subgenus in zoology; 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 unrivalled source of information on zoological research worldwide.

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 its staff. It also houses a unique archive.

ILLUSTRATIONS

Cover: Sand gazelle *Gazella subgutturosa* at Uruq Bani Ma'aride, Saudi Arabia, released in collaboration with the National Commission for Wildlife Conservation and Development.

Text photographs: Dave Clarke, Conservation & Consultancy Division, Terry Dennett, Peter Denton, King Khalid Wildlife Research Centre, Michael Lyster, Mike McQueen, Ken Taylor.

EDITORIAL

Peter H. Denton and Unity McDonnell.

MESSAGE FROM THE PRESIDENT
SIR MARTIN HOLDGATE



The Society has had another successful year. The annual accounts, now presented in a revised format that meets the latest requirements of charity accounting, show us to have achieved a substantial surplus of income over expenditure for the year. We have been granted a new Royal Charter. At London Zoo, the Ambika Paul Children's Zoo has opened and is proving a major attraction. The Hyacinthine Macaw Aviary, the first new building for five years, was funded by the donations to the 'Save our Zoo' campaign and plans are well advanced for the Madagascar Centre and a new Invertebrate House. We have agreed terms of a new 60-year lease with our landlords in Regent's Park, The Department of National Heritage.

At Whipsnade, a splendid new restaurant and banqueting facility has replaced the old one destroyed by fire and the many notable births in the Park confirm Whipsnade's pre-eminent breeding record. The Institute of Zoology has restructured its research programmes to ensure they are all driven by a conservation theme. Conservation and Consultancy continue to do sterling work and are expanding their sphere of influence into Nepal, the Philippines and new areas in Africa. The Library has increased its clientele significantly and the income achieved from reproduction rights and archival images goes some way to offsetting running costs.

The definition of a 'successful year' has to be subjective. There are many positive advances to record but a backlog of maintenance remains at both London Zoo and Whipsnade; the Mappin Terraces, potentially the most exciting animal habitat in the Zoo, remain closed and decisions will soon have to be taken over rehousing the elephants at Whipsnade. The Fellowship continues to dwindle. Measured against the yardsticks of a modern, vital professional Society, the world's most outstanding centres for animal conservation, and the best examples of education and information about animals, we have a long way to go.

Realism dictates that we cannot do everything at once. Both zoos have produced their business plans and have established professional fundraising teams. As new resources permit, we will take further steps to display and breed threatened species in settings attractive both to the animals and to the visitors who come to strengthen their commitment as allies for nature. A new Fellowship scheme will shortly be in place, attracting people into a Society which continues to provide a forum for both professional and amateur zoologists. The appointment of a Director-General is intended to strengthen our cohesion as an organization, uniting our work for science, education and animal conservation, both in captivity and in the field. I seek the continued support of all our Fellows, members and well-wishers as we move forward.

A handwritten signature in black ink, which appears to read "Martin Holdgate". The signature is written in a cursive, flowing style.

PRESIDENT

PATRON: HER MAJESTY THE QUEEN

COUNCIL 1994-95

*Attendance
at Council**

7/8	President:	Sir Martin Holdgate, CB, MA, PhD, FIBiol
7/7	Treasurer:	P J Wrangham (to 18.1.95) H Wilkinson MA, FCA (from 18.1.95)
1/1		
9/9	Secretary:	Professor R McNeill Alexander, PhD, DSc, FIBiol, FRS
9/9		J Barrington-Johnson
3/4		S Bearder, PhD
9/9		B C R Bertram, MA, PhD, FIBiol
3/4		W J Boyce DM, MA, MSc, MRCP, FFPHM
9/9		M R Brambell, MA, VetMB, PhD
6/9		S Cobb, DPhil
7/9		G J Cutting
9/9		Professor A S D Farmer, PhD, CBiol, FIBiol, FLS, FMBAI, ARPS
4/4		M J Ford, DPhil
4/4		Councillor M Jiggins, FRICS, FSVA (<i>Nominated Member</i>)
9/9		J M Knowles, OBE
3/4		K Livingstone MP (from 28.10.94)
6/9		Dame Anne McLaren, BA, DPhil, FRS
8/9		M Rowson, MA
4/4		K J Sims
7/9		The Hon Peregrine Simon, QC, FLS
3/4		A J Stevens, MA, BVSc, MRCVS, DipBact
9/9		Miss J Thornback, MSc
9/9		I Webb, BSc(Econ), MBA

*Actual/potential

HONORARY FELLOWS

*Date of
election*

1977	HRH The Prince Philip, Duke of Edinburgh, KG, 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 Museum National d'Histoire Naturelle, 55 rue de Buffon, Paris 53, France
1975	Professor Jean Dorst Museum National d'Histoire Naturelle, (Mammifères et Oiseaux), 55 rue de Buffon, Paris 53, France
1978	Professor Jose C H Carvalho Museu Nacional, Quinta da Boa Vista, Rio de Janeiro, Brazil 20940
1984	Professor Ernst Mayr Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts 02138 - 2902, USA
1988	Professor Dr Milton Thiago de Mello Instituto de Ciencias Biologicas, Universidad de Brasilia, Brasilia, Brazil DF70 910
1990	Professor Knut Schmidt-Nielsen Department of Zoology, Duke University, Durham, North Carolina 27706, USA
1990	Professor John Z Young Emeritus Professor of Anatomy University College London, Gower Street, London WC1E 6BT
1992	Professor Edward O Wilson Museum of Comparative Zoology, Harvard University, 26 Oxford Street, Cambridge, Massachusetts 02138-2902, USA

COMMITTEES AND BOARDS 1994-1995

Animal Welfare Committee

Terms of Reference: To advise Council on matters relating to animal welfare in the Collections, at both London Zoo and Whipsnade Park, at the Institute of Zoology and in the work of the Conservation & Consultancy Division.

Professor D M Broom, BVMS, MRCVS
R Ewbank, OBE, MVSc, CBiol, FIBiol
Professor T R Halliday, DPhil
A J Higgins, BVetMed, MSc, PhD, MRCVS
I F Keymer, PhD, FRCVS, FRCPath, CBiol, FIBiol
A Lindley, MA, DPhil
Professor A R Peters, DVetMed, BA, PhD, FRCVS
D G Pritchard, BVetMed, BSc, MPH, MRCVS
A J Stevens, BVSc, MRCVS, DipBact, *Chairman*
Professor I R Swingland, BSc, PhD
Secretary: J K Kirkwood, BVSc, PhD, MRCVS

Awards Committee

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

Professor P P G Bateson, PhD, ScD, FRS
Professor B Bayne, PhD, FIBiol
G Boxshall, PhD, FRS
P Harvey, DPhil, DSc, FRS
Professor M P Hassell, DPhil, DSc, FRS, *Chairman*
Professor G A Parker, PhD, FRS
Professor P Racey, BSc, FRSE, FIBiol
Professor K Simkiss, PhD, DSc, FIBiol
Professor L Wolpert, CBE, DIC, PhD, FRS
Secretary: Unity McDonnell, MA

Conservation & Consultancy Board

Terms of Reference: To supervise the affairs of the Conservation & Consultancy Division, on behalf of Council. To maintain a watching brief on conservation policy for the Society in relation to its Mission Statement. To advise all other divisions of the Society on matters relating to conservation.

J Barzdo
S Cobb, DPhil
Professor A S D Farmer, PhD, CBiol, FIBiol, FLS, FMBAL, ARPS
Professor T R Halliday, DPhil, *Chairman*
D Macdonald, DPhil
The Hon Peregrine Simon, QC, FLS
Ex officio: A J Stevens, BVSc, MRCVS, DipBact
Secretary: Miss Alexandra Dixon, BA, MSc

Education Committee

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

J Barrington-Johnson
Mrs Ven Bolton
G Cutting
S F Everiss, MBE, MSc, FIBiol
S Flowerday, MSc
I Hattingh, BSc
Professor A Lucas, BEd, PhD, FIBiol, *Chairman*
S T Pollock, MSc(Hons)
Mrs Wendy Riddle
A Smith, PhD
Secretary: Claire Robinson BEd/Margaret L Williams BSc, PGCE

Publications Committee

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

Professor R J Berry, PhD, DSc, FRSE, FIBiol, FLS, *Chairman*
S Albon, PhD
G A Boxshall, PhD, FRS
M Bruford, PhD
J Gurnell, PhD
Marion Nixon, PhD
P Herring, PhD
Professor R C Tinsley, PhD
Secretary: Juliet Clutton-Brock, PhD, DSc

International Zoo Yearbook Editorial Board

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

Marcia A Edwards, PhD, FLS
N L Jackson
Professor Janet Kear, OBE, PhD
I F Keymer, PhD, FRCVS, FRCPath, CBiol, FIBiol
J M Knowles, OBE
Georgina Mace, DPhil
J J C Mallinson, CBiol, FIBiol, FRGS, *Chairman*
Professor R J Wheeler, OBE, CBiol, FIBiol, FRSA, FRSE
Secretary: P J S Olney, BSc, DipEd, CBiol, FIBiol, FLS

Institute of Zoology Committee

Terms of Reference: To advise the Society and the University of London under the terms of the Agreement between them; to consider and make recommendations on all matters relating to the Institute of Zoology.

Professor B C Clarke, DPhil, FRS
Professor B G Gardiner, PhD, DSc
Professor S Jones, PhD
Professor L E Lanyon, BVSc, PhD, MRCVS, *Chairman*
R Pellew, PhD
Professor K Simkiss, PhD, DSc, FIBiol
Professor G A Targett, PhD, DSc (to 28 February 1995, resigned)
EX OFFICIO:
University of London
Vice Chancellor
Principal
Chairman of Convocation
Zoological Society of London
President
Secretary
Treasurer
Director of Science
Secretary: E W Thompson, PhD, DSc

London Zoo Board

Terms of Reference: To supervise all matters relating to the operation of London Zoo covering animal management, visitor operations, preparation of draft budgets, operational target setting and monitoring, staffing, marketing, capital and development projects.

W J Boyce, DM, MA, MSc, MRCP, FFPHM
M R Brambell, MA, VetMB, PhD, MRCVS, *Chairman*
J H W Gipps, PhD
A Jackson (from 14 September 1994)
M G Rowson, MA
Miss Jane Thornback, MSc
D Tunnicliffe, CBE (to 24 May 1994)
Secretary: P H Denton, MBIM

Whipsnade Wild Animal Park Board

Terms of Reference: To advise Council on all matters relating to the operation of Whipsnade Wild Animal Park covering animal management, visitor operations, preparation of draft budgets, operational target setting and monitoring, staffing, marketing, capital and development projects.

S D Earley, M Inst D
Professor T R Halliday, DPhil
J M Knowles, OBE, *Chairman*
C J S Marler
N S E Martin, FBIM, FIIM
R Smith
I Webb, BSc(Econ), MBA
Secretary: Linda Hughes

Learned Society Board

Terms of Reference: To be accountable to Council for, and supervise all matters relating to, the policy on finance of the Learned Society comprising the Fellowship, the Library, the general secretariat and, working closely with its own committee, the Publications Department: to monitor adherence to the Society's objects: to initiate income generating measures through exploitation of the Society's archive and by other means.

B C R Bertram, MA, PhD
J C Edwards, MA, *Chairman*
Marcia A Edwards, PhD, FLS
M J Ford, DPhil
J P Griffin, BSc
Professor R C Tinsley, PhD (to 4 July 1994, resigned)
M D Ward
Secretary: P H Denton, MBIM



London Zoo's benefactor Dr Swraj Paul and Secretary of State for National Heritage the Rt. Hon. Stephen Dorrell, MP, meet the goats in the 'Touch Paddock' of the Ambika Paul Children's Zoo.

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REVIEW OF THE YEAR

A new President and a new Treasurer were elected during the year. Sir Martin Holdgate succeeded Sir John Chapple as President on 1 June; Mr Harry Wilkinson took over from Mr Peter Wrangham as Treasurer on 18 January. Dr Anne McLaren remained a Vice-President, with The Hon Peregrine Simon QC, replacing Professor Malcolm Peaker who retired from Council, as the other Vice-President.

Financial matters remained to the fore in Council's deliberations. The tight cost control practised throughout the Society was maintained, resulting in yet another cash surplus for the year, the third in succession. The worst Easter weather in living memory resulted in both London Zoo and Whipsnade starting the new financial year in deficit, but both had clawed back visitor numbers by the year end. The underlying financial performance of London Zoo has improved, being largely independent this year of the support of the Stamford Raffles Patron, and the Board is confident that this healthy trend will continue. The Institute of Zoology recovered from its deficit position of two years ago and the Conservation and Consultancy Division for the first time returned a surplus. The Learned Society Division, comprising the library, publications and fellowship, consolidated its financial performance. The overriding trend is, therefore, encouraging.

COUNCIL AND BOARDS

Elections to Council in 1994 maintained the now well established pattern. There were 12 candidates: five Scientific Fellows and seven Ordinary Fellows. The percentage of Fellows voting was 33.5%. Members of Council were made aware of their more onerous responsibilities as Trustees of the Society as a result of recent legislation and decided to advise the electorate of those candidates who would, if elected, in the opinion of the Council provide for a balanced Council and maintain continuity. Two Fellows who had been nominated to serve, but were not supported by Council or successful in the ballot, formally represented to the President their view that Council had acted unfairly in thus advising members. They exercised their rights under the constitution and a second ballot ensued which confirmed the previous decision. A poll of 42% was recorded. The issues were raised at the Annual General Meeting, where the debate provided valuable guidance on the conduct of future elections.

The ballot for election to Council in 1995 benefited from a more 'hands off' approach. Council did not indicate preferences amongst the candidates. They did, however, detail in a covering letter those attributes which it was thought desirable for Council members to possess.

Council met on nine occasions, two of the meetings being held at Whipsnade. Average attendance was 85%, with eight members being present at all meetings. The December meeting enjoyed the rare spectacle of 100% attendance.

The new Charter and Byelaws were granted by the Privy Council on a petition from the Society, on 15 March 1995. In the ballot of Fellows necessary in order to obtain a mandate to change the Charter, 41% of those eligible voted and of those, over 93% indicated

their support for the new constitution. The most significant changes brought about by the new Charter and Byelaws will be the Society's year end changing to 31 December, a redefining of the charitable objects of the Society, a revision to the term of office of the Officers and, for the first time, a stipulation that vacancies on Council shall be filled by a ballot of Fellows. Delay occurred in introducing the new membership scheme outlined by Dr Bertram at the AGM. This was due primarily to problems having been experienced with the membership software, commissioned in the London Zoo Division, on which the Fellowship administration is dependent. Only when Council is confident that the software is meeting its needs will the go-ahead be given to implementing the new scheme.

Council resolved during the year to appoint a Director General, while retaining the main operational Boards as agents of Council and as such accountable for overseeing the effective management of their domain. At the same time, the Council emphasised the responsibility of the Director General as line manager for all the Society's staff, accountable for the effective representation of the policies laid down by the Council, Boards and Officers. Recruitment to the post was in hand as this report went to press.

ANNUAL GENERAL MEETING

The Annual General Meeting was held on 28 September 1994 with the President, Sir Martin Holdgate, in the chair.

The meeting was immediately preceded by the presentation of the awards for contributions to zoology that had been announced in last year's annual report. Winners received their awards from the President; in addition, the winners of the Society's Marsh Award for Conservation Biology and of the Thomas Henry Huxley Award, and the representative of the Prince Philip Prizewinner's School, were presented by Mr Brian P Marsh with cheques generously donated by the Marsh Christian Trust. The presentations were followed by short reports by the Directors, outlining progress and plans in each of the five divisions of the Society.

In accordance with Article 10 of the Charter & Byelaw 25, the following Fellows retired as Ordinary Members of the Council: Mr D Tunnicliffe and Mr M A Moore (Ordinary Fellows); Professor T R Halliday, Professor M Peaker and Mr C H Tudge (Scientific Fellows).

In accordance with Article 11 of the Charter and Byelaw 26, Sir Martin Holdgate was elected as President and the following Fellows were elected as Ordinary Members of Council: Dr J Boyce and Mr K J Sims (Ordinary Fellows); Dr S Bearder, Dr M J Ford and Mr A J Stevens (Scientific Fellows). Mr Ken Livingstone, MP, filled the casual vacancy caused by the resignation of Professor R Tinsley.

Right: Dr Bill Bourne with the Stamford Raffles Award presented to him at the 1994 AGM. The bronze was commissioned from the sculptor Anita Mandl thanks to a generous donation from the HSBC Group.

THE MEMBERSHIP

At 31 December 1994, there were 2,010 Fellows and 1,710 Associates, including 69 Student Associates.

Amongst those distinguished persons of whose deaths the Society heard with deep regret were Sir Barry Cross, Secretary of the Society 1989-1992; Dr Frank Yates, former Council member; Lord Shackleton; Mr David Sussman, former member of the London Zoo Board; Professor Pontus Palmgren, Corresponding Member; Miss Eirwen Owen, Ordinary Fellow and former Director of Administration, ZSL; Mr Gerald Durrell, Ordinary Fellow and founder of the Jersey Wildlife Preservation Trust; Lady Huxley, Ordinary Fellow and widow of Sir Julian Huxley; Mr Nigel Bonner, former member of the Publications Committee, Professor Brongersma, Honorary Fellow; and Sir Alfred Beith the former MP and rhinoceros conservationist.

Four Sundays, spread through the year, were set aside for Fellows, with each day being dedicated to an unusual aspect of the Society. A film show of some of the 156 hours of film in the archive allowed Fellows to wallow in nostalgia and the 'Zoo of old' theme was maintained when Mr Keeling conducted another of his popular historical tours of the Zoological Gardens. The birthday of Sir Stamford Raffles was marked by the staging of a 'museum day' featuring many of the Society's archives not normally on show. These ranged from the ZSL prospectus of 1825, the 1829 Charter, 'Jumbo' memorabilia, The Zoological Society of London Act of 1929 (which enabled Whipsnade to be established) and just a small selection from the many thousands of original paintings and prints in the collection. A botanical tour of the gardens provided a pleasant diversion and the AGM was marked by another 'Fellows Day', on which those intending to come to the AGM could see for themselves in the morning the latest developments in the Zoo and could hear something of proposals for the future.

Four editions of the Member's Newsletter were published and the Society remains indebted to Mrs Roberta Davies and her team who kindly undertake the tasks of editing and



design. Production costs were kept to a minimum thanks to the generous support of Mr Cutting and a group of volunteers who uncomplainingly label, fold, envelope and despatch the Newsletters and associated material.

In order to provide the Society with an Annual Report that would serve as promotional material as well as inform the Fellowship of activities during the past year, a new design and new production techniques have been adopted within strict financial constraints.

GENERAL ACTIVITIES

During the year, the Society became an accredited member of the Foundation for Science and Technology. The Society also continued to play an active part in the local community, with the Clerk to the Council being a committee member of the 'Friends of Regent's Park'. For the third year running, this organisation held its annual general meeting in the Society's meeting rooms. Visitors to these rooms enjoyed the exhibition, on display for three months, of the winning entries from the Hawk and Owl Trust's photographic competition.

The Rt Hon Peter Brooke MP, Secretary of State for National Heritage, visited London Zoo on 24 May to open the Hyacinthine Macaw Aviary; his successor as Secretary of State, Stephen Dorrell MP, lunched with the Officers and toured the grounds in January. Mr Ian Sproat MP, also from the Department of National Heritage, visited the Zoo and the animal hospital in March. He showed considerable interest in the Society's determined and successful efforts to meet its running costs from revenue.

AWARDS AND HONOURS

Council announced the following awards made for contributions to zoology in 1994. These will be presented at the 1995 AGM.

The Scientific Medal (awarded to zoologists 40 years of age and under, in recognition of scientific merit) to Dr J D Altringham, of the University of Leeds, for distinguished contributions to muscle physiology; to Dr B T Grenfell, of the University of Cambridge, for distinguished contributions to population demography and epidemiology in vertebrates; and to Dr Anne E Magurran, of the University of St Andrews, for outstanding work on the maintenance of biological diversity and on the role of predation in the evolution of social behaviour.

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 M F Land, FRS, of the University of Sussex, for continued excellence in experimental work on vision which reveals general principles and leads to an understanding of nature's oddities.

The Zoological Society of London Marsh Award for Conservation Biology (for contributions of fundamental science and its application to the conservation of animal species and habitat) to Professor Ian Newton, FRS, of the Institute of Terrestrial Ecology, for laying secure foundations for the conservation of birds through his distinguished studies of



Mr Ian Sproat, MP, Parliamentary Under-Secretary of State, Department of National Heritage, visiting the Animal Hospital in March. Left to right: Keeper Chris Preston with 'Gloria' the African fish eagle, Professor R. McNeill Alexander, Sir Martin Holdgate, Mr Ian Sproat and Mr Tony Sainsbury.

their life history and population dynamics.

The Stamford Raffles Award (awarded to an amateur zoologist for distinguished contributions to zoology) to Mrs J Hall-Craggs, for her long-standing contributions to the description of bird song in all its variety.

The Thomas Henry Huxley Award (for original work submitted as a doctoral thesis) to Dr Mark S Witter, of the University of Bristol, for his thesis 'The ecological costs of being fat'. The thesis by Dr Alison J Cooper, of the University of Cambridge, 'Limitations of bumblebee flight performance', was commended.

The Prince Philip Prize (open for competition to pupils under 19 years of age, of schools or other places of education in the United Kingdom, the Channel Isles or the Isle of Man, on the basis of an account of practical work involving some aspect of animal biology) to Stephen Towers, of Balfron High School, Glasgow, for his essay 'A study of the distribution of invertebrates in a freshwater loch, Loch Ardenning'.

PERSONNEL

Approximately 350 permanent staff are employed by the Society. Together with seasonal staff and people employed overseas by the Conservation and Consultancy Division, this takes the total to over 450 at some points of the year.

In July, Miss Alexandra Dixon was confirmed as Director of the Conservation and Consultancy Division, having been Acting Director since the departure of David Jones in March. Norman Reed joined the Society in May as Director of Finance, replacing Lester Corp who took up the post of Finance Director at the Royal Albert Hall.

Dr Heather Hall transferred from the Conservation Genetics Group of the Institute of Zoology to take up the post of Assistant Curator, Lower Vertebrates, and Paul Pearce-Kelly was appointed as Assistant Curator of Invertebrates at London Zoo.

Awards

Council resolved to award the Society's Silver Medal to Dr Marcia A Edwards, Assistant Director of Science and Editor of the Society's scientific publications, including the *Journal of Zoology*, in recognition of her distinguished services to the Society and to zoology. The Medal was presented by the President when Dr Edwards retired at the end of May, after 38 years on the staff of the Society. The Society's Bronze Medals were awarded at the lunch preceding the AGM to Miss Joan Jupp and Dr Geoffrey Smith, both of whom had given long and meritorious service to the Society.

The following two candidates successfully passed the City & Guilds Certificate in Zoo Animal Management: Mr K Lloyd and Miss M C Lamb.

Departures and Retirements

Long-serving staff who left during the year, (years of service in brackets) included:

Dr Marcia Edwards, Assistant Director of Science, Publications & General (38); Dr G R Smith, Deputy Director of Science (29); Dr D E Bidwell, Research Associate (29); Mr R Wingate, Deputy Co-ordinator, Whipsnade (25); Mr D Risley, Assistant Curator, Lower Vertebrates (20); Mr T Noble, Animal Technician (18).

Obituaries

We regret to record the deaths of the following pensioners: Ms L Bathurst; Mr W Kelton; Miss E M Owen, CBE; Mr R P Humphries; Mr R Stratford; Mr A V Scotchmer; Mr A T Wilson.

STAFF AND VOLUNTEERS

STAFF

Staff in post at 31 March 1995

ZOOLOGICAL SOCIETY OF LONDON:

Director of Science: Professor L M Gosling, PhD FIBiol
Director, London Zoo: J H W Gipps, PhD
Chief Executive, Whipsnade Wild Animal Park: S D Earley, MInst D
Director, Conservation & Consultancy Division: Miss Alexandra Dixon, BA, MSc
Director of Finance: N J Reed, BSc, FCA
Director of Personnel: I M Meyrick, BA, FIPD
Clerk to the Council: P H Denton, MBIM

CENTRAL FUNCTIONS

Administration

Clerk to Council: P H Denton, MBIM
Secretary to the Officers: Mrs Anne Chapman

Personnel

Director of Personnel: I M Meyrick, BA, FIPD
Senior Personnel Officer: Ms Paula Harris, GradIPD
Personnel Administrator: Ms Marcia Latty, GradIPD
Pensions Administrator: T P Carey

Consulting Staff

Medical Referee: K H Lewis, MA, BM, BCh

Finance

Director of Finance: N J Reed, BSc, FCA
Secretary: Mrs Susan Morgan
Financial Accountant: Miss Joan Jupp
Management Accountant: C J Biggie; J M Wright, FCA
Cash Book Keeper: Miss Lynette Archer-Morgan
Chief Cashier: D P Lack
Cashiers: L Oxley; J A Piggott; P A Gibbs
Payments Supervisor: Mrs Rhonda Rodrigues
Wages Clerk: Miss Jackie Owen

LEARNED SOCIETY

Library

Librarian: Ms Ann Sylph, BSc, MSc, MI Inf Sc
Library Assistant: Ms Kate Ferguson, BA, DipEd, DipLib
Library Assistant: M Palmer, BA

Publications

International Zoo Yearbook
Editors: P J S Olney, BSc, DipEd, CBiol, FIBiol, FLS; Miss Pat Ellis;
Mrs Fiona Fiskens, BSc
Clerk/Typist: M G Barratt
Journal of Zoology, Symposia, Nomenclator Zoologicus, Zoological Record
Editor, Journal of Zoology: Juliet Clutton-Brock, PhD, DSc
Assistant Editors: Miss Angela J Stroud, BSc; Miss Unity M M McDonnell, MA
Editorial Assistant: Mrs Patricia Manly
Honorary Editor, Zoological Record and
Nomenclator Zoologicus: Marcia A Edwards, PhD, FLS

Fellowship

Fellowship Officer: Mrs Patsy Conway

INSTITUTE OF ZOOLOGY

Director: Professor L M Gosling, PhD, FIBiol
Director's Phormone Research Team: Elizabeth A Thornton, BSc; Samantha Prestage, BSc
Honorary Research Fellows: A J E Cave, MD, DSc, FRCS, FLS;
Sir Cyril A Clarke, KBE, MD, FRCP, FRS
Honorary Overseas Research Fellows: R M Eley, PhD; J Samour Hasbun, DVM, PhD;
C R Thouless, BA, PhD; R A Brett, MA, PhD
Office Manager/PA to Director of Science: Linda Forbes, BSc
Secretaries: Maureen Thompson; Joanne Keogh; Catherine Kerr
Laboratory Superintendent (Nuffield): P G Cottingham, BTec(CED), MISCt
Laboratory Superintendent (Wellcome & Hospital): G F Nevill, HND
Chief Technician (Animals): M J Llovet, FIAT
Senior Technician (Animals) Whipsnade: A G Hartley, BAgriSc
Animal Technicians: Mandy Gordon, IIAT; Caroline Layram, OND, Whipsnade;
J Rozowski; D R Stula
Senior Workshop Technician: W G Ray, AIScT
Senior Photographic Technician: T R Dennett
General Laboratory Aides: Jean Hutchins; Breda Farrell

Reproductive Biology

Research Fellows: Professor A S I Loudon, PhD (Head of Group); W V Holt, PhD;
Anne Stirland, PhD; H N Jabbour, PhD; Alison Moore, PhD; C G Faulkes, PhD
Honorary Research Fellows: J Garner, DMV; H J Shaw, PhD
Postgraduate Research Students: P Riley, BSc; R Lucas, BSc;
D Bainbridge, MA VetMB, MRCVS; L Clark, BSc; C Stafford, BSc; F Clarke, BSc;
A Medrano, BSc
Senior Technicians: Daphne I Green, HNC, AIScT
Technicians: Sheila C Boddy, BSc; Yasmin N Mohammad, MSc; Sunita Patel, BSc;
Patricia Lovell, HNC

Conservation Genetics

Research Fellows: M W Bruford, PhD (Head of Group); Helen F Stanley, PhD;
Elizabeth Barratt, PhD; M Beaumont, PhD
Honorary Research Fellows: R K Wayne, PhD; R Hammond, PhD; H J Hall, PhD
Research Associate: J de Ruiter, PhD
Senior Technician: D Cheesman, BTec, HNC
Postgraduate Research Students: M Bayes, BSc; C Ciofi, BSc;

T Coote, BSc; Tamsin Burland, BSc; K Clarke, BSc
Technicians: S P Casey, BSc; Miranda Kadwell, BSc; Sian Colley BSc;
Harriet Green, BSc; Emma Taylor BSc; Katherine Jeffery, BSc;
Dada Gottelli, BSc; Saffron Townsend, BSc; R Deaville, BSc

Ecology

Research Fellows: S D Albon, PhD (Head of Group); J R Ginsberg, PhD;
A F G O'D Bourke, PhD; Sarah M Durant, PhD; A Balmford, PhD
NERC Research Fellow: I P F Owens, PhD
NERC Research Fellow (Advanced): Georgina M Mace, DPhil
Research Associate: T Coulson, PhD
Postgraduate Research Students: Sarah L Gascoyne, BSc, VetMB, MRCVS;
S Williams, BSc; Melanie Kershaw, BA; Manuela Fonseca, MSc;
Isabelle Porteous, DipVetMed; G Chan, BSc; Daniella de Luca, BSc; T Jones, BSc
Technicians: Jill G Pilkington, BSc; Ailsa Curnow, BSc (p/t)

Comparative Medicine

Honorary Research Fellow: A Voller, PhD, DSc

Veterinary Science

Zuckerman Research Fellow - Senior Veterinary Officer: J K Kirkwood, BVSc, PhD, MRCVS (Head of Group)
Research Fellow: P M Bennett, PhD
Honorary Research Fellows: G H Du Boulay, CBE, MB, BSM, FRCP, DMRD; P Kertesz, BDS, LCS, RDS
Pathologist: A A Cunningham, BVMS, MRCVS
Veterinary Officer (London): A W Sainsbury, BVMS, MRCVS
Veterinarian: Paul Jepson, BVMS, MRCVS
Veterinary Officer (Whipsnade Wild Animal Park): E Flach, MA, VetMD, MSc, MRCVS
Senior Veterinary Nurse: A K Fitzgerald, VN
Technician: S Macgregor, HTec
Veterinary Nurses: Christine Dean, VN; Gillian Bennett, VN; Ilona Furrokh, BSc (Whipsnade)
Administrative Assistant (p/t): Charlotte Iskjaer-Ackley
Postgraduate Research Student: Debra Bourne

CONSERVATION AND CONSULTANCY DIVISION

Director: Miss Alexandra Dixon, BA, MSc
Secretary: Mrs Irene Finch
Research Assistant: Ms Claire Belsham, BA

Overseas Staff

K Dunham, BSc, MPhil; J R B Flamand, BSc, BA, MA, VetMB(Cantab); W Flavell; R Hammond, PhD; C Kichenside; R Kock, MA, VetMB, MRCVS; T Wachter, PhD

LONDON ZOO

Director: J H W Gipps, PhD
Secretary to the Director: Miss Fiona Jamieson

Animal Management Division

Senior Curator: S Tonge, BSc
Secretary: Miss Catherine Proud, BA
Conservation Programmes Co-ordinator: Ms Sarah Christie, BSc
Registrar: Miss Elspeth Chaplin
Zoo Manager: W B A James
Assistant Curator of Mammals: D M Richardson
Assistant Curator of Invertebrates: P Pearce-Kelly
Assistant Curator of Lower Vertebrates: Heather Hall, BSc, PhD
Keepers In Charge: M E Carman; B J Harman; G S Asher; B Harris;
Mrs Linda Walker; F W Smith; P R Harrington; Miss E Wenman, BA;
D Clarke; R Charter; F Wheeler
Senior Keepers: M S Clark; J B Robson; M A Hennessey; J Nicklin;
D E Robinson; M J Tiley; T W March; S J Matchett;
P A Spanner; J H Pullen; K Lloyd; M Fagg;
Mrs Linda DaVolls, BA; J Buchan; A James; L Sambrook
Qualified Keepers: Miss Jacqueline Ossowski; S Mannall; M S Fitzpatrick;
Miss Amanda Ferguson, BSc; D McGinnie; C E Wickenden;
Miss Sarah Carter; Miss Carol Wilson; J Boyd; Miss Caroline Connor;
Miss Margaret Lamb; S Young
Trainee Keepers: P Kybett; J W Stevens; Miss Andrea McKenna; Miss Tracy Lee;
C Walker; S Whitelock; D Glynn; Ms Mary Welsh; Ms Vanessa Long;
Ms Una McCarthy; Miss Susan Davey; Ms Nichola Burnett; D Rowlett;
Patricia Croft, PhD; Ms Karen Nolan, BSc; Ms Patsy Joseph

Marketing

Head of Marketing & Public Relations: Ms Sharon Ament
Secretary: Miss Jill Ratcliffe
Group Sales & Travel Trade Executive: J Hosking
Press & PR Officer: Miss Kirstie Watson
Membership Executive: Miss Gina Guarnieri
Lifewatch Adoptions Administrator: Miss Jane Keating
Sponsorship and Promotions Executive: Mrs Jacky Rattue
Marketing Administrator: Miss Theresa Butler

Development

Development Manager: Mrs Valerie Pakenham-Keady
Administrator: Miss Lisa Friend
Corporate Fundraiser: B Addenbrooke

Education

Head of Education: Miss Claire Robinson, BED
Education Officers: Miss Joanne Chamberlain, BSc; Miss Sandi Bain, BSc
Education Officer (Special Needs): Vacant
Volunteer Co-ordinator: Ms Michelle Gerlis, BSc
Bookings Co-ordinator: Ms Penny Inglis, BA
Interpretation Officer: Miss Clare Kelly, BSc

General Services

General Services Manager: G Roden
Maintenance Supervisor: P Davies
Secretary: Mrs Dot Price
Building Craftspeople: P D Bell; A Connolly; M Foster; J C Froud; T Sheehan; M Mursell; S Roberts; W F Manly
Electricians: C G Rolfe; R Fitzgerald; P Smith
Semiskilled Craftsperson: J Baker
Gardens Supervisor: Miss Julie Smith
Chargehands: D Burke; Mrs Yvonne Morris
Gardeners: R J Lynch; Miss Michelle Malka; S Taylor; Ms Fiona Williamson; N Heaphy; M Baker
Purchasing & Transport Chargehand: R J Pearce
Drivers/Stores Assistants: R E Harrison; R Ashmore
Stores Assistant: A W James
Supplies Buyer: C P Major
Signmaker/Print & Stationery Buyer: A Taylor
Grounds Supervisor: P Walker-Croft
Groundstaff Chargehand: J Turner
Drivers: G A Houlder; O Tiwari
Groundsperson/Sweepers: A W Ransome; J Breen
Toilet Attendants: Mrs Beatrice Ampong; Miss Bindi Lee; Mrs Anna Thornburrow; Mrs Kay Rajah
Driver: A Martin

Projects

Acting Projects Manager: B Edwards
Secretary, Projects (p/t): Mrs Clare Boscawen
Contracts Co-ordinator: M J Swallow

Retail

Retail Manager: Mrs Yvonne Ubels
Assistant Retail Manager: Mrs Jayne Powell
Office Administrator: Mrs Beryl Kinsella
Supervisors: G Constantine; Mrs Evon Nicholas
Warehouse Supervisor: R Bruce
Sales Assistants: Miss Patricia Delius; Miss Dawn Houlder

Visitor Operations

Visitor Operations Manager: B Nutkins
Secretary: Miss Brenda Tonks
Admissions Officer: R McLaughlin
Asst. Admissions Officer: Mrs Suzanne Cole
Senior Gatekeeper: C Ramdass
Gatekeepers: Ms Ramatu Sesay; Mrs Patience Djima; Miss Tami Houlder
Security Gatekeepers/Carpark Attendant: P K Brown; P A J Gabriel; S Sturgeon; Ms Veronica Powell
Ticket Collector (p/t): J W Richards
First Aid Attendant: Miss Grace Reay
Weekend First Aid Attendant: Miss Cliona Wheeler
Receptionists: D Hitchcock; Mrs Barbie Ordish
Telephonists: Mrs Brenda Ambrose; S Shokoufan; Mrs Christine Labbett
Events Co-ordinator: R Tomlinson
Senior Presenter: A Hallsworth
Presenters: C Preston; R Goodchild
Pit Gatekeeper/Cashiers: Miss Josephine Simmons; S Guna; Miss Leila Grunsell; M Talykadar; Miss Bala Patel
Car Park Attendant: A Aremu

WHIPNADE WILD ANIMAL PARK

Chief Executive: S D Earley, M Inst D
Financial Controller: R Bodnarec
Projects & Operations Manager: A Coates, BA, DipArch
Assistant to the Chief Executive: Miss Linda Hughes
Administrative Assistant: Miss Anna Williams
Cashiers/Wages Clerks: Mrs Joan Lee; A Portas
Accounts Clerk: Mrs Carol Davies
Assistant Accounts Clerk: Miss Zoe Gill
Receptionist/Clerk: Mrs Margaret Hull

Park Services

Park Services Co-ordinator: M Shillingford
Chargehand (Works): G Guild
Craftsmen: D Law; J C Harrold; M Guild; J Whinnett
Drivers: J E Baisbrown; J Bradley
Stores Co-ordinator: A Latham
Gardener: R Scanlan

Retail and Main Gate

Retail/Gate Co-ordinator: Mrs Maureen White
Senior Gatekeeper: H Jackson
Assistant Supervisor (Retail): Miss Margaret Matthews

Railway

Engineer: I Gordon

Animal Management

Curator: N Lindsay, BSc, CBIol, MIBiol
Assistant to Curator: Mrs Dena Richards
Regional Co-ordinators: A R White; V Curzon; R Hutton
Deputy Co-ordinators: C Bates; C Tack
Animal Activities Co-ordinator: L J Radford
Animal Activities Deputy Co-ordinator: G Frost
Senior Activities Staff: A Reeve
Animal Activities Staff: P Williams
Senior Keepers: A E Morris; Miss Marilyn Spittel; K Taylor; M Lear;

R M Catchpole; J E Baines; J C Chapman; T Moxey; Mrs Joy Lear; Mrs Carole Day; M Best; M Brett

Qualified Keepers: Miss Leanne Waterhouse; D Fisher
Trainee Keepers: C White; M Clarke; P Curzon; Miss Michelle Povada, BSc; Mrs Veronica Watkins;
L Warren; Miss Sarah Gollop; M Holden, BSc; Miss Rebecca Cooper.

Catering

Catering Manager: J Thornicroft
Assistant Catering Manager: Mrs Sue Covington
Assistant Trainee Catering Manager: Miss Zoe Fitzpatrick
General Catering Assistant (p/t): Mrs Margery Grizzell

Marketing & Development

Marketing & Development Manager: Miss Frances Sutton
Marketing Executive: Miss Nicole Morse, BA
Membership Administrator: Miss Tracey Cross
Sales Executive: Miss Jane Pardoe, BSc

Education

Senior Education Officer: Miss Margaret Williams, BSc, PGCE
Volunteer Co-ordinator: G Lucas

VOLUNTEERS

London Zoo

Krysia Al Yawer; Don Alvarez; Rajan Amin; Margaret Armstrong; Fran Audric; John Ayrey; Norma Barnett; J. Barrington Johnson; Lisa Bayer; Pam Beanlands; Nilgun Bishop; Denise Blackwell; Helen Brandon-Jones; Sarah Brocklehurst; Sally Brough; Andrew Brown; Simon Brown; Elaine Brumstead

Lilah Cameron; Eve Carpenter; Johanna Carse; Debbie Catt; David Chan; Tony Choleston; Amanda Church; Sandra Cleary; John Clifford; Sid Cocks; Andrew Coleman; Mary Colewill; John Collins; Sue Constant; John Cooper; Dorothy Copeland; Jackie Cottrell; Richard Creighton; Daphne Cross; Isabel Cruickshank; Ann Curtis; Geoff Cutting

Gladys Davies; Jennie Deco; Kathleen Dixon; Don Driver; Joan Eggmore; Mary Elgin; Beth Evans; Neil Faith; Felix Fifer; Jo Finegan; Jill Fleming; Elizabeth Formoy; Susan Fraser; Janet Gates; Celia Gaya; Dave Gibson; Trish Gibson; Angela Gillham; Mary Godwin; Valery Golding; Barbara Gordon; Nevil Gorthy; Len Gould; Elizabeth Grabow; Dorothy Gyngell

Sheila Haes; Maureen Hart; Ron Hart; Pat Healy; Lisa Hodgekinson; Joyce Hunter-Lieberman; David Hutchison; June Ingram; Kate Isherwood; Sheila Jackson; Harry Jadeja; Cyril Johnson; Heather Johnson; Iris Johnson; Edward Jones; Bev Jordan; Geoffrey Kenton; Eric King; Wyn Knowles; Kam Kumar

Ruby Langrell; Margaret Lawrence; Jon Lee; Belinda Line; Joy Long; Rhonda Maclean; Flavia Malim; Tim May; Jackie McMahon; Shuna Mitchel; H A Moore; Beryl Moss; George Mumford; Jackie Mutton; Alison Noyes; Mandy Odwell; Stephen Otter; Prafulla Patel; Sally Penfold; Grace Pirie; Jonathan Pollard; Dilvia del Prato; Sue Preston

Sean Raffles; Grant Rattray; Dorothy Reed; Jean Reich; Ian Robinson; Kerstin Rucht; Jane Sackett; Elaine Scott; Sunny Segal; Diane Shearing; Jean Sherman; Siva Sivaganeshan; Valery Skinner; Claire Smith; Jo Smith; Maurice Sobell; Ruth Sober; Margaret Stafford; Nicola Stratzullo; Paula Svensson

John Thompson; Maggie Tighe; Michael Tigwell; Brenda Tonks; M Tracey; Mrs Wailes; Amelia Walker; Amanda Waterfield; Delene Welch; Kate Whyte; Marion Winter; Anita Winrow; Tracy Wombwell; David Wooderson; Jonathan Wright.

Whipsnade Wild Animal Park

Karen Adams; Jean Anderson; Michael Atkins; Heather Bardner; Brian Bates; Kirsty Bevan; Jill Bilcock; Jill Broad; Leile Brown; Carol Butler; Louise Carter; Sidney Cocks; Maureen Cook; Ann Coultate; Marion Cowan; Ronald Cowan

Eileen Dent; Catherine Dyer; Kathleen Eames; Kenneth Eames; Arthur Ellis; Tracy French; Mary Frost; Denis Garner; Erica Godman; Nevil Gorthy; Robert Green; Jim Griffin; Norman Hancock; Pauline Hodgson; Dorothy Jane Isaacs; Austin Janes; Caroline Jones; Jeff Knowles

Jennifer Lewis; Gillian Loose; Malcolm Mackenzie; Eileen March; Miriam Martin; Betty McHugh; Pat Mitchell; Lynn Paynter; Derrick Pendar; Lucy Pendar; Audrey Perrott; Ildid Putnam; Enid Ranson; Christopher Richardson; Elizabeth Richmond; Suzanne Rush

Rebecca Sandifer; Raye Sawyer; Peter Scrivener; Christine Sharpe; Kenneth Sharpe; Walter Smith; Mary Snoxall; Tony Stevens; Paul Susman; Samantha Taylor; Hans van der Grinten; Arthur Waring; Elizabeth Webb; Naomi White; Pat Wickens; Jennifer Wynn.

THE LEARNED SOCIETY

THE LIBRARY

The Library recorded over 5,600 visitors, an increase of 11% on the previous year, and received 2,400 enquiries from members of the Society and the general public.

Lord Jenkins of Hillhead launched the Lord Zuckerman Memorial Appeal on 25 May, the first donation being from Prince Philip, a former President of the Society. The aim is to establish a fund to assist in the archive conservation programme and provide an up-to-date library service through the use of modern technology. Donations to the appeal have come in throughout the year and over £28,000 has been received so far. The names of all the donors have been recorded in a memorial volume which is retained in the library. As a result of this fundraising, a number of initiatives have commenced. A microfiche reader/printer has been obtained. This will allow greater access to many of the archives which have been microfilmed, including press cuttings going back to 1843. A comprehensive survey of the conservation requirements was produced and recommendations already implemented include retaining the services of three conservators from Allyson McDermott Associates, who spent two weeks on site cataloguing and cleaning the watercolours, photographs and prints in the collection. They were assisted by nine volunteers who were each given training. Environmental conditions for archive storage have been improved through the installation of new extractor fans in the basement.

The Institute of Zoology funded the purchase of a computer together with a subscription to the 'Cambridge Life Sciences Collection' on CD-ROM. This allows rapid searching of data to locate references on particular subjects. The 'Life Sciences Collection' contains records from 21 abstract journals covering biological, medical and agricultural sciences. The Library also has *Zoological Record* on CD-ROM, permitting the rapid searching of zoological literature back to 1978.

Two 'behind the scenes' tours were held for Fellows and Associates as well as a special tour for members of the London Archive Users Forum. Without exception, attendees expressed great surprise at the extent of the Society's holdings.

The first full year of the reciprocal agreement with the library of the Royal Entomological Society has been successful, with a growing number of Fellows from each organisation visiting the other's premises.

Income-generating activities during the year have included a corporate library membership scheme, and the launch by Quintessa Art Collections of a set of eight high-quality reproductions of butterfly prints from the Society's copy of *Dissertation sur la Generation et les Transformations des Insectes de Suriname* by Marie Sibelle Merian, published in 1726. The Library has also been promoting the Society's collection of photographs and other images. A publicity leaflet about the collection was distributed to members of the Society of Picture Researchers and Editors (SPRED). As a



The launch of the Zuckerman Memorial Appeal: the Librarian, Ann Sylph, shows Lord Jenkins and Lady Zuckerman some of the Library treasures.

result of this and other publicity, income from such reproduction rights has more than trebled from the previous year to £7,000. A sale of secondhand books, held to coincide with a Tuesday Talk, raised over £800. Two Christmas cards were commissioned. One depicts the architecture of London Zoo and the other is a reproduction of a snow leopard by Joseph Wolf, one of the printed works in the Society's collection. The cards were sold widely within the zoos and throughout the Society. In addition, and for the first time, the Society exhibited in the '4C' Corporate Charity Christmas Card catalogue. The result of all these initiatives is that the library will more or less cover its costs, perhaps a unique achievement for such an academically orientated establishment.

The Library is grateful to those persons and organisations who donate books, contribute to the Library's funds or spend time assisting Library staff. Donors this year include: Professor R McNeill Alexander, Mrs J Ansell, Dr E D Barlow, Mr K A Bernhardt, Mrs A M Binns, Mr D R Bird, Mr L Bird, Mr C W Blaikley, Professor P Brain, Mr D Campling, Field Marshal Sir John Chapple, Professor J L Cloudsley-Thompson, Mr P Daszack, Mr P H Denton, Mr M Derrick, Mr A J Desmond, Mr K M Dunham, Mr D Dunbar, Mrs A Edwards, Mr J C Edwards, Dr S K Eltringham, Dr N J Evans, Mr D Fifield, Professor P Glees, Mrs B Gordon, Gordon Fraser Charitable Trust, Dr J J Greenwood, Mr D Griffiths, Mr R W Hale, Mrs R W Hale, Mrs R A Harris, Mr P Hayward, Lady Head, Sir William Henderson, Mr R Hoath, Mr D Hughes, Mr G Kenton, Mr M Kozdon, Dr R M Laws, Mrs J Lemkin, London Archive Users Forum, Mr T May, Mrs C Newman, Ottar Nordli, Dr J F Oates, Dr N Ortiz, Miss F Philp, Mr B Rackley, Mr E R E Salter, Dr R Sheldrake, Mr B Shephard, Dr T J Shrestha, Dr M Sobell, Mr R Spencer, Dr C Spinage, Dr R Stebbings, Mrs A K Steer, Ms R Sutton, Miss J Szkutnicki, Miss L Tomsett, Mr P Tuley, Ms P Tyson Stroud, Mr D Vrettos, Miss A Waterfield, Mrs J F White, The Worshipful Company of Mercers, The Worshipful

Company of Skinners, Dr E C Zimmerman.

PUBLICATIONS

Journal of Zoology

At the end of May 1994, Dr Marcia Edwards retired after 13 years as Editor of the *Journal*. She has been succeeded by Dr Juliet Clutton-Brock, who was previously a Principal Scientific Officer in the Mammal Section of the Natural History Museum, London. Two parts of the *Journal*, Vol. 232 part 4 and Vol. 233 part 1, containing 24 papers, were published under the editorship of Dr Edwards. This high level of production has been maintained in the remaining 10 parts published during the year, Vol. 233 part 2 to Vol. 235 part 3, which contained 130 papers. The new Editor does not intend to change the wide scope of the *Journal*, presenting, as it always has, the cutting edge of research in the whole field of zoology. However, as such research branches into exciting new endeavours in molecular biology and conservation science, so the *Journal* will aim to reflect these new directions in its published papers.

Zoological Record

Volume 130 (1993/94 literature) of *Zoological Record* was published in December 1994. The volume, which comprises 27 separately issued sections, contains details of 66,165 items, located by searching 6,580 different serial titles and 1,183 books. A significant number of these items refer to more than one animal group and are therefore indexed in more than one section to give a total of 74,941 citations for the entire volume. Indexing for Volume 131 (1994/95 literature) began in July and is progressing on schedule. As noted in the 1993-94 Report, some production operations were transferred from BIOSIS in Philadelphia to BIOSIS UK in York during 1994, and all the operations which are unique to *Zoological Record* are now performed in the UK. This includes production of PostScript tapes for the printer and tapes for

the online vendor and CD-ROM products. In addition, responsibility for the editorial content of the *Zoological Record Search Guide* was relocated to York in 1994, in preparation for the next edition in 1995.

There were no significant changes in policy for coverage during the year. However, there is some concern that the amount of material within the scope of *Zoological Record* continues to grow while the resources available to index it remain relatively static. Some benefit has been gained from the introduction of the new computer system, but consideration will have to be given to increasing staff or restricting the coverage of non-taxonomic material if comprehensive coverage of the core is to be maintained in future.

A Long Service Awards ceremony was held in December, when John Anderson, President of BIOSIS, presented Certificates and gifts to 11 staff with a total of 150 years service to BIOSIS and the Zoological Society in the preparation of *Zoological Record*. One individual, Michael Perry, was the recipient of the President's Award for Outstanding Achievement in January.

The User Services staff continue to run the European Help Desk and to provide training as required in the UK for all BIOSIS services. They and other BIOSIS UK staff took part in a number of meetings of biological societies and other events throughout the UK, providing exhibits at several of these.

A World Wide Web server for *Zoological Record* was made available on the Internet from York at the beginning of 1994, and this was linked with the BIOSIS WWW server in Philadelphia when that was in turn introduced towards the end of the year. The UK server provides information about *Zoological Record* and links to the US server for information about other BIOSIS services. It also provides links to zoological information available elsewhere on the Internet and attempts to make this more easily accessible by organizing it into appropriate categories.

Unavoidable delays in the publication of the draft of the new *Code of Zoological Nomenclature* have meant that progress



Using the Library's resources to generate income: two of the series of Merian prints launched by Quintessa Art Collections.

toward making *Zoological Record* the Official Register for Available Generic Names in Zoology has been limited. Work has continued to find ways of making appropriate information available once the Register is operational, possibly over the Internet, so that scientists may check on the validity of names in the interval before the published *Zoological Record* appears.

BIOSIS UK staff took part in a meeting held under the auspices of CODATA to discuss the possibility of a joint program with IUBS to develop a 'global master species database'; a working party is carrying this forward. BIOSIS UK staff also held discussions with the Inter-Agency Taxonomic Information System project in the United States. This is a partnership of federal agencies who have joined together to cooperatively develop and manage a database of basic taxonomic information. In both cases it is hoped that collaboration with *Zoological Record* can make more effective use of limited

resources in providing nomenclatural information to those involved in handling biological material outside the taxonomic laboratory.

The Director General of the British Library Document Supply Centre and the Director of the Natural History Museum in London continue to make facilities available to assist in the compilation of *Zoological Record*; this valuable support is much appreciated.

International Zoo Yearbook

'Aquatic birds' is the special topic in Section 1 of Volume 33 of the *International Zoo Yearbook* published at the end of 1994. The 22 papers concentrate on bird groups from those families with strong associations with water. Four papers covered penguins, including a report on preliminary work on the Conservation Assessment and Management Plan (CAMP) for New Zealand taxa; another CAMP report deals with the Anseriformes. Breeding and conservation projects for individual species include the Milky stork *Mycteria cinerea*, Marabou stork *Leptoptilos crumeniferus*, Waldrapp ibis *Geronticus eremita*, the New Zealand Black stilt *Himantopus novaezelandiae*, flamingos and alcsids and there are substantial reviews of pelicans *Pelecanus* species, the Black stork *Ciconia nigra*, management of colonial waterbirds, as illustrated by the Scarlet ibis *Eudocimus ruber*, and longevity and breeding records of ibises and spoonbills. A report on the walk-through Wetland Aviary at Theine Zoo discusses the practicalities of maintaining waterbirds in a balanced ecological display and, finally, a review of methods of identification of individuals tackles a problem which is of particular relevance for colonial species. The 15 papers in 'New developments in the zoo world', as always, cover a wide range of species; of particular note is a detailed paper on the Aye-Aye *Daubentonia madagascariensis* from Duke University Primate Center. Volume 33 also contains the annual data on breeding of vertebrates in zoos for 1992, the census of rare animals in captivity at 1 January 1993 and the annual list of



The President presents the Society's Silver Medal to Dr Marcia A Edwards, who retired as Assistant Director of Science in May.

international studbooks.

The special topic for Section 1 of Volume 34, currently in preparation, is 'Aquariums'. Among the 18 papers in 'New developments in the zoo world' is an important discussion document on the role of zoos in conservation.

The reference section includes an up-dated list of 'Zoos and aquariums of the world', the list of vertebrates bred in 1993, the census of rare species in captivity at 1 January 1994, and the summary of international studbooks and world registers.

The senior editor, P J S Olney, continues his work, under the auspices of the Conservation Breeding Specialist Group (CBSG), as co-ordinator of over 140 international studbooks and world registers.

SCIENTIFIC MEETINGS, SYMPOSIA AND SEMINARS

Seven Scientific Meetings were held during the year. The summer meetings were 'The zoological witness' in May, which gave examples of how zoology might be applied in forensic, archaeological and commercial investigation, and 'Island biogeography' in June. In the autumn there were meetings on 'Why animals fight', an exploration of the nature and biology of aggression, in October, 'Environment and extinction through the elephant's eye' in November, and in December

'The ecology of owls in Britain'. 'Aphid dispersal' was discussed in February, and in March, exploring the question 'Has the frog a future?', speakers considered the global decline of amphibian populations and how to conserve them. Attendances were generally higher than in the previous year, an improvement which it is hoped will continue.

The series of Tuesday Talks initiated in autumn 1993, held monthly at 7 pm and open to the public as well as to members, continued with talks from Dr Georgina Mace and Mr Simon Tonge, in May and June respectively, and ended on a high note in July when Professor David Bellamy spoke on 'The Wallace Line - a vision for south-east Asia'. It was decided that the Tuesday Talks should continue in the autumn. Speakers in the first year had largely been drawn from the Society's staff, but the net for the new series was cast more widely.

Mr Nigel Sitwell, speaking in September on 'Galapagos: problems in Paradise', brought a welcome influx of visitors from the Galapagos Society. The next two meetings deserved better attendances than they got: October, when Mr Adrian Barnett described 'The weird uakaris - mystery monkeys of the Amazon', and November, when Mr Peter Prince of the British Antarctic Survey gave an excellent and superbly illustrated talk on 'The

teeming sea: wildlife of South Georgia'. As a change from the natural history and conservation problems of remote corners of the world, Dr Pat Morris brought December back home and down to earth with 'Hedgehogs'. In the New Year, Mrs Lena Godsall-Bottriell presented evidence for the existence of the King Cheetah, 'The inconvenient cat', and Mr Mick Carman talked about 'The Giant Panda in the wild and captivity'. For the final meeting of the year, in March, Professor Ghilleen Prance, FRS, Director of the Royal Botanic Gardens at Kew, surveyed the plants, people and animals of the Amazonian Brazil in his talk 'The diversity of the Amazon rain forest and its future'.

One symposium was held in the period. 'Miniature vertebrates: the implications of small size', on 11 and 12 November, was organized for the Society by Dr Peter Miller.

The Institute of Zoology's programme of short scientific Seminars on Tuesday afternoons continued, eight or nine seminars being held during each academic term for Institute of Zoology staff and invited guests. The Institute is grateful to all contributors to this seminar series.

The Society's grateful thanks are due to all those who contributed, as speakers, chairmen, organizers, or helpers, to the success of these various meetings.

PUBLICATIONS BY THE SOCIETY'S STAFF

Publications by staff and research workers of the Society's Institute of Zoology appear separately, in the Institute's Scientific Report for 1994.

Brown, N (1994). Getting back to the wild. *Vet. Times* 24: 8-9.

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Carman, M (1994). *European Sulawesi crested macaque (Macaca nigra) studbook No. 1*. London: Zoological Society of London.

Christie, S (1994). *European studbook for the Sumatran tiger (Panthera tigris sumatrae) No. 3*. London: Zoological Society of London.

Christie, S (1994). *European studbook for the Amur tiger (Panthera tigris altaica) No. 1*. London: Zoological Society of London.

Christie, S (1994). *European studbook for the Arabian oryx (Oryx leucoryx) No. 2*. London: Zoological Society of London.

Clark, M, Ferguson, A., Maskell, A & Smith, F (1994). Breeding the Black-footed penguin *Spheniscus demersus* at London Zoo. *Int. Zoo Yb.* 33: 19-23.

Clarke, D (1994). The CERC species list. In *Invertebrates in captivity 1994*. Sonoran Arthropod Studies Institute: Tucson.

DaVolls, L (1994). *B.I regional gibbon (Hylobates sp.) studbook No. 16*. London: Zoological Society of London.

Dunham, K M (In press). The re-introduction of gazelles in Arabia. In *Arabian gazelles (2nd edn)*. Habibi, K (Ed.). Immel: Saudi Arabia.

Habibi, K & Thouless, C (In press). Social behaviour of the sand and mountain gazelles. In *Arabian gazelles (2nd edn)*. Habibi, K (Ed.). Immel: Saudi Arabia.

Habibi, K & Williamson, D T (In press). The conservation and management of Arabian gazelles. In *Arabian gazelles (2nd edn)*. Habibi, K (Ed.). Immel: Saudi Arabia.

Kitchenside, C & Lindsay, N (In press). The husbandry of gazelles. In *Arabian gazelles (2nd edn)*. Habibi, K (Ed.). Immel: Saudi Arabia.

Kingswood, S, Rebholtz, P, Vassart, M & Kumamoto, T (In press). Cytogenetic and molecular systematics of Arabian gazelles: chromosomes, proteins and nucleic acids. In *Arabian gazelles (2nd edn)*. Habibi, K (Ed.). Immel: Saudi Arabia.

Mohammed, O B (In press). Parasites of Arabian gazelles. In *Arabian gazelles (2nd edn)*. Habibi, K (Ed.). Immel: Saudi Arabia.

Mohammed, O B & Hussein, H S (1994). The antibody prevalence of toxoplasmosis in Arabian gazelles and oryx in Saudi Arabia. *J. Wildl. Dis.* 30: 560-562.

Pearce-Kelly, P, Clarke, D & Mace, G (Eds) (1994). *Partula '94: an action plan for the conservation of the Family Partulidae*. Revised version. London: Zoological Society of London.

Pullen, J (1994). *B.I. regional studbook for dourocoulis (Aotus sp.)*. London: Zoological Society of London.

Richardson, D M (1994). An introduction to the wild canids of South America. *Wolf Watch* No. 2.

THE INSTITUTE OF ZOOLOGY



Students attending the new MSc course in Wild Animal Health which is run jointly by the Institute of Zoology and the Royal Veterinary College.

THE INSTITUTE OF ZOOLOGY

The Institute has continued to develop an active research programme in conservation biology, supported by core funding from the Higher Education Funding Council for England and by remarkable success in competing for additional research grants and contracts. Funding organisations include the Research Councils, Government Departments, the European Commission and conservation trusts. Out of a total income of £2.9 million, 44% has been raised from external sources. As in 1993/94, a modest budget surplus will be achieved in the 1994/95 financial year and there is every sign that the Institute is in a sound financial position.

A University of London grant of £240,000, with a smaller contribution from Institute funds, allowed the complete refurbishment of the animal accommodation in the Nuffield Building and the associated staff facilities. Similar upgrading has been carried out in the Institute's laboratory facilities at Whipsnade. Collectively, these developments represent a major investment in support of our laboratory studies and in particular in developing techniques for assisted reproduction in captive breeding of threatened species.

Dr G R Smith retired after nearly 30 years at the Institute, latterly as Head of the Comparative Medicine Group and Deputy Director. Dr R K Wayne left the Conservation Genetics Group to take up a faculty position at UCLA and was replaced as Group Head by Dr M W Bruford.

TEACHING AND RESEARCH COLLABORATIONS

The Institute maintains an active programme of teaching, at both undergraduate and postgraduate level. Staff from the Ecology and Conservation Genetics Groups contribute to the MSc course in Conservation at University College London and this contribution will be reorganised and expanded in 1995/96. A substantial input to a Master of Research degree, funded by the Natural Environment Research Council and run at UCL, has been

planned for the 1995/96 academic year. Other notable contributions are to MSc courses at the Durrell Institute of Conservation and Ecology at the University of Kent, to the diploma course in Endangered Species Management at the Jersey Wildlife Preservation Trust and to the Tropical Biological Association field courses in Uganda.

The Veterinary Science Group has promoted education in veterinary aspects of the care and conservation of wild animals for many years. The establishment of a one-year Master's course in Wild Animal Health, in collaboration with the Royal Veterinary College, represents a major development in these endeavours. The curriculum covers a wide range of disciplines relevant to the care of threatened wild animals and leading authorities from Britain and elsewhere are contributing to the teaching. Twelve veterinarians from eight countries are attending the 1994/95 course and, at the time of writing in March 1995, there is already a healthy flow of applications for the 1995/96 course. A new veterinary teaching facility is being built at Whipsnade to provide further resources for this course.

The programme of training for the PhD degree continues to expand, although with 23 students now registered we are probably close to the number that can be accommodated reasonably. The Institute has an excellent record in doctoral research and, to help to maintain this position, we have designed and implemented a new Code of Practice for the Supervision of PhD Students and appointed a postgraduate tutor, Dr Chris Faulkes. Part of the tutor's job will be to maintain links with the various universities at which our students are registered.

Active research collaborations are a feature of the Institute's links with a large number of universities and institutions both in Britain and abroad. Two new developments highlight these relationships. The first is the appointment of Dr Henry Jabbour to a joint post shared by the Reproductive Biology Group of the Institute and the Basic Sciences

Department at the Royal Veterinary College. The second is the formation of the Centre of Ecology and Evolution, a research centre with core membership from the Institute and the Departments of Biology, Genetics and Biometry and Biological Anthropology at University College London.

CONSERVATION GENETICS

An important area in the preservation of biodiversity is the application of genetic analyses to understand and quantify biodiversity from the level of communities through to species, populations and individuals. The Conservation Genetics Group is addressing fundamental problems in this area and applying these analyses to specific problems in biodiversity management.

Molecular techniques are a powerful tool for identifying species in conservation programmes. An example concerns the pipistrelle bat, where two distinct types were recently discovered through differences in echolocation frequency. In collaboration with colleagues at the Universities of Aberdeen and Bristol, we are investigating genetic variation between the two types by sequencing mitochondrial DNA. Two very distinct sequence types (clades) are present, and when gene sequence was compared to the echolocation frequency, there was a perfect correlation. Not only have we observed the genetic difference between the phonic types but, when we sequenced other pipistrelle species, we found that the species split into the two clades with the two pipistrelle phonic types occurring in different groups - suggesting that the taxonomy of the whole of the genus *Pipistrellus* requires further study!

We are investigating the genetics of fragmented and small populations, and are interested in understanding hybridisation, population history and genetic variation. In collaboration with the Conservation and Consultancy Division of ZSL and the Saudi National Commission for Wildlife Conservation and Development, we are studying the endangered gazelles of the Arabian peninsula. The local Mountain gazelle, Sand gazelle, and Saudi Dorcas gazelle have come close to extinction over the last 100 years. Genetic analysis is helping to identify source populations from the wild for captive breeding as well as helping to guide the management of captive populations which are now being released back into the wild.

Molecular techniques can be used to deduce parentage in wild and captive populations, and several projects reflect the importance of applying these in conservation. In collaboration with the University of Chicago, we have studied the effect of social behaviour on the genetic structure of savannah baboons in Kenya. In the first direct test of the relationship between dominance and male reproductive success through a 'priority-of-access' model in wild primates, our results confirmed the paternity predictions based on the dominance model and those based on observed mating behaviour. Also, as predicted from the female social group residence patterns, relatedness was greater among adult females than adult males, and mother-offspring and full-sibling pairs had relatedness values approximately twice those



Fluorescent photomicrograph of frozen and thawed spermatozoa from the threatened Dama gazelle (*Gazella dama mhorr*). The Institute of Zoology is currently investigating the reproductive biology of this species with the aim of establishing a genetic resource bank to support the survival of reintroduced animals.

of half-siblings. We have shown that the observed social structure produced genetic patterns that provide the means by which social behaviour can be maintained and evolve.

ECOLOGY

New methods are needed to assess priorities for the conservation of species and areas and the Ecology Group is actively developing such techniques. In collaboration with the Species Survival Commission of the World Conservation Union (IUCN) we have helped to develop improved, quantitative criteria for including species in global lists of threatened species such as Red Data Books and the IUCN Red List of threatened animals. These new criteria have recently been adopted by IUCN.

Field conservation actions are based largely upon protected areas, and the question of how to select priority areas for conservation has become critical. Species distribution data from Natal, South Africa, have been analysed to examine the consequences of extrapolating from priorities based on one taxonomic group to another. Taxonomic groups that are good predictors of diversity in other groups are those that show relatively large amounts of species turnover across environmental gradients. In Natal, using plant distribution data was effective for identifying areas important for mammals and birds. However, the same analysis of mammal and bird data was not effective for plants. Other analyses have been undertaken at a global level using species distributions compiled by Bird Life International for restricted-range birds. Broad scale analyses of species distribution data indicate that the restricted-range birds provide a reasonable surrogate for other species, and may be used to identify global patterns and priorities.

The Ecology Group has continued its research on the factors that govern population abundance with a number of major studies, including that on the dynamics of the Soay sheep population on the island of St Kilda and more recently on reindeer in Spitzbergen. Further studies explore the role of interspecific competition in structuring communities of closely related species and its role in reducing populations of competitively inferior species. Previous research on cheetahs in the Serengeti National Park has shown that 90% of cheetah cubs die before independence and that lions are the single biggest cause of this mortality. Lions, and hyenas (an additional source of

mortality through feeding competition), have increased in recent years and as a result, cheetahs are thought to be declining. Recently, a canine distemper virus has killed up to 40% of lions on the Serengeti Plains and effectively provided a 'natural' experiment on how changing densities of competitors may affect each other. If cheetah numbers were previously limited by lions an immediate improvement in recruitment should occur.

REPRODUCTIVE BIOLOGY

The work of the group has included investigations in spermatogenesis, ovarian function and oocyte development, the development of assisted reproduction techniques and the role of seasonality and behaviour as reproductive control mechanisms.

A large part of the Group's work continued to be devoted to developing techniques for the breeding of endangered species using artificial insemination, *in vitro* fertilisation and embryo transfer. Using deer and sheep as model species for the ungulates, we are carrying out studies of the physiological environment in which maternal support for the developing embryo is provided, with a view to developing assisted breeding programmes. A programme of artificial insemination in Dama gazelles has been undertaken in collaboration with the Estación Experimental de Zonas Áridas in Spain, who are breeding this species for reintroduction.

Correct synthesis and targeting of sperm membrane proteins during spermatogenesis is crucial to normal sperm development and subsequent function during fertilisation, but the contribution of haploid gene expression to the relative fertility of individual cells is poorly understood. We are currently investigating the temporal expression of several genes in testicular germ cells, while concurrently localising the protein products by electron microscopy. Cryopreservation and sperm function assessment are important in programmes for the planned preservation of genetic diversity through genetic resource banking and depend on knowledge of sperm membrane architecture and function.

Studies of behaviour and seasonal timing mechanisms have focused on the control of sexual behaviour in deer and on developing appropriate laboratory rodent models. New insight into the genetic control of biological timing has been achieved by using a strain of hamster which has a genetic defect of its biological clock. Further research aims to clarify the nature of the biological clock in a subterranean 'blind' Naked mole rat and evidence of a residual visual system has recently been obtained. Additional studies include the comparative molecular genetics of African mole rats and the evolution of sociality. This group of species (Bathyergidae) provides a unique mammalian model exhibiting the broadest range of social behaviours of any mammalian family.

VETERINARY SCIENCE

Identifying the factors that cause a population to decline is a crucial step in species conservation. In some cases, for example when the decline is due to extensive habitat loss, the cause may be readily apparent but in others,

pinpointing key factors can be very difficult. Subtle changes in the health status of individuals caused by, for example, sub-clinical infectious or toxic agents, nutritional disturbances or combinations of such factors may have sufficient impact on mortality or reproductive rates to render a population unable to sustain itself. Investigations of causes of disease and mortality can thus be critical for populations whose viability is in doubt and such investigations, in both captive and free-living populations, are a major part of the work of the Veterinary Science Group. The identification, through clinical and post mortem investigations, of diseases that constrain the viability of populations of the wide variety of species kept in the Society's animal collections at London Zoo and Whipsnade Wild Animal Park presents many challenges, as does the development of ways of preventing or controlling these diseases. Current subjects of study in free-living populations include: investigations of disease in marine mammals and birds around the coasts of England and Wales, the epidemiology of parapoxvirus infection in red squirrels in the UK, causes of abnormal mortality incidents in common frogs in Europe and the epidemiology of rabies in carnivores in the Serengeti.

Many conservation programmes require movements of animals between captive or free-living sub-populations in order to maintain genetic diversity. One of the problems associated with these movements is the potential for accidental introduction of infectious disease into previously unaffected populations. This can be a complex problem because, when animals from one ecosystem are brought into close proximity with those from another, as may occur in zoos or as a result of habitat changes or translocations in the wild, they may be exposed to novel infectious agents and the epidemiology and consequences of such infections may be hard to predict. For these reasons the quarantine and screening of animals entering the collections and the maintenance of vigilance for new infections are very important and constitute another large component of the Veterinary Science Group's work.



One of the Institute's PhD students - George Chan, working in the Ecology Group.

COLLABORATION WITH ZOOLOGICAL, CONSERVATION AND RESEARCH ORGANISATIONS

Details of collaboration and representation by staff and research workers of the Institute of Zoology appear separately, in the Institute's Scientific Report for 1994.

Collaborative projects

- Bedfordshire Bat Group*: Collaborative work on conservation of local bat species.
- British Airways Assisting Conservation*: Collaboration on conservation of Great bustard; Collaboration in joint training programme between Whipsnade and Game and Wildlife Department in Ghana.
- Dar Al-Handasah, Egypt*: Designs for Madinah Zoo, Saudi Arabia.
- English Nature*: Reintroduction of Wartbiter and Field crickets; Management of SSSI at Whipsnade.
- Great Bustard Trust*: Collaborative work on management and conservation of Great bustards.
- HM Customs*: Housing and advice on identification of reptiles.
- Kenya Wildlife Service*: Secondment of Dr R Kock as senior veterinarian.
- King Mahendra Trust for Nature Conservation*: Assistance for Chitwan National Park.
- Kingston University, Surrey*: Protozoal infections of reptiles and invertebrates.
- Laboratoire de Biologie des Invertébrés, Valbonne, France*: Project to rescue the Italian ground beetle.
- National Commission of Wildlife Conservation and Development, Saudi Arabia*: Management of King Khalid Wildlife Research Centre.
- National Parks and Wildlife Management Department, Zimbabwe*: Joint funding with Rhino Rescue of seconded mechanic.
- Open University*: Studies of Peafowl at Whipsnade.
- Royal Botanic Gardens at Kew*: Collaboration in *Partula* reintroduction programme.
- Saratov Regional Authority, Russia*: Joint programme for conservation of Great bustard.
- Save the Rhino Trust, Namibia*: Funding for anti-poaching vehicles.
- Thrigby Hall Wildlife Gardens, Norfolk*: Research projects on captive breeding and insemination.
- University of Cambridge*: Behavioural study on Patagonian cavy at Whipsnade; Behavioural ecology study of Chinese water deer at Whipsnade.
- University of East London*: Protozoal infections of reptiles and invertebrates.
- University of Oxford*: Studies of Peafowl at Whipsnade.
- WHO Collaborative Centre for the Control of Antivenoms, Liverpool School of Tropical Medicine (The Alistair Reid Snake Venom Research Unit)*: Advice on housing and management of venomous snakes.

Representation

- Bedfordshire Education Business Partnership*: Ms M Williams (Member).
- Bedfordshire Technical College, Leisure & Tourism Panel*: Ms M Williams (Member).
- Cambridge College of Agriculture and Horticulture*: Whipsnade Industrial Link.
- Department of the Environment*: Miss A M Dixon (Member of Bio-Diversity Advisory Group).
- European Association of Zoological Parks and Aquaria*: Mr J Buchan (Member, EEP Primate TAG); Mr M E Carman (Member, EEP Primate TAG); Miss S K Christie (Member, EEP Felid, Bovid and Primate TAGs); Mrs L DaVolls (Member, EEP Primate TAG); Dr J H W Gipps (Member, EEP Primate TAG); Mr N B D Lindsay (Member, Red-crowned Crane, Cheetah, White Rhino, Indian Rhino, Grevy's Zebra, Przewalski's Horse, Pygmy Hippo, Bongo, Gaur, Scimitar-horned Oryx and Musk Ox EEPs; Member, EEP Gruiformes and Deer TAGs); Mr D M Richardson (Member, EEP Felid, Bovid, and Marsupial TAGs); Mr S Tonge (Member, EEP Bovid and Ciconiform TAGs); Mr F Wheeler (Corresponding Member, EEP Marsupial TAG).
- Fauna and Flora Preservation Society, Conservation Committee*: Mr P Pearce-Kelly (Member).
- Federation of Zoological Gardens of Great Britain and Ireland*: London Zoo (Member); Whipsnade Wild Animal Park (Member).
Council: Miss Alexandra Dixon (Council Representative for Fauna & Flora Preservation Society); Mr S Earley (Hon. Treasurer); Dr J H W Gipps (Member).
- Joint Management of Species Group Committee*: Miss S K Christie (Corresponding Member); Mr S Tonge (Member); Mr D M Richardson (Member).
- Conservation and Animal Management Committee*: Miss Alexandra Dixon (Member); Mr N B D Lindsay (Member); Mr S Tonge (Member).
- Education Committee*: Ms M Williams (Member).
- Taxon Advisory Groups*: Mr J Buchan (Member, UK Primate TAG); Mr M E Carman (Member, UK Primate TAG); Miss S K Christie (Member, UK Primate TAG; Chairman, Gibbon Sub-Group; Member, UK Felid and Bovid TAGs); Mr D Clarke (Member, UK Terrestrial Invertebrate TAG); Mrs L DaVolls (Member, UK Primate TAG); Miss A M Dixon (Member, UK Rhino TAG); Miss A Ferguson (Member, UK Owl TAG); Mr M S Fitzpatrick (Member, UK Small Carnivore TAG); Dr H Hall (Member, Fish and Aquatic Invertebrate TAG; Member Triops Study Group); Mr N B D Lindsay (Chairman, UK Rhino TAG; Co-Chairman, UK Crane TAG; Member, UK Bovid and Equid TAGs); Mr T Moxey (Member, UK Terrestrial Invertebrate TAG); Mr P Pearce-Kelly (Member, UK Terrestrial Invertebrate TAG; Chairman, Orthoptera and Mollusc Sub-Groups); Mr J H Pullen (Member, UK Primate TAG); Mr L Radford (Member, UK Marine Mammal TAG); Mr A Reeve (Member, UK Diurnal Raptor TAG); Mr D Richardson (Member, UK Felid TAG; Co-Chairman, UK Bovid TAG); Mr S Tonge (Co-Chairman, UK Bovid TAG; Member, UK Parrot, Pigeon, Passerine, Pigeon and Reptile TAGs); Miss E Wenman (Member, UK Reptile TAG); Mr F Wheeler (Member, UK Small Carnivore TAG); Mr A White (Member, UK Penguin TAG); Mr B E Wingate (Member, UK Reptile TAG).
- Ghana Game & Wildlife Department*: Mr N B D Lindsay (Adviser to Zoo Committee).
- Gibbon Rehabilitation Project, Phuket, Thailand*: Miss S K Christie (Member).
- Institute of Fisheries, Management Committee*: Dr H Hall (Member).
- International Breeding Programme for the Giant Panda*: Dr J H W Gipps (Member).
- International Species Inventory System*: The Zoological Society of London (Corporate Member).
- International Species Recovery Committee for the Golden Lion Tamarin*: Dr J H W Gipps (Member).
- International Touraco Society*: Mr P Harrington (Chairman).
- International Union of Directors of Zoological Gardens*: Dr J H W Gipps (Member).
- IUCN - World Conservation Union (Species Survival Commission)*: Miss S K Christie (Member, Cat and Conservation Breeding Specialist Groups); Miss A M Dixon (Member, Conservation Breeding, Antelope, Parrot, and Reintroduction Specialist Groups); Dr J R B Flamand (Member, Antelope and Veterinary Groups); Dr J H W Gipps (Member, Conservation Breeding, Primate and Reintroduction Specialist Groups); Mr N B D Lindsay (Member, Reintroduction and Insectivore Specialist Groups); Mr P Pearce-Kelly (Member, Conservation Breeding, Mollusc, and Reintroduction Specialist Groups; Chairman, CBSG Invertebrate Group); Mr P J Olney (International Studbook Coordinator, Conservation Breeding Specialist Group; Emeritus Member, Reintroduction Specialist Group); Mr D M Richardson (Member, Cat and Conservation Breeding Specialist Groups); Mr S Tonge (Member, Tortoise and Freshwater Turtle, and Madagascan Reptile and Amphibian Specialist Groups).
- Madagascan Fauna Group*: The Zoological Society of London (Corporate Member).
- Marwell Preservation Trust*: Mr N B D Lindsay (Member, Scientific and Animal Management Committees).
- Oxford Brookes University*: Ms M Williams (Visiting Lecturer).
- Sumatran Tiger PHVA and Captive Breeding Workshop, Indonesia*: Miss S K Christie (Member); Mr D M Richardson (Member).
- Thai Gibbon PHVA*: Miss S K Christie (Member).
- UK Dependent Territories, Conservation Forum*: Miss A M Dixon (Member); Mr P Pearce-Kelly (Member, Executive Committee).
- Wild Animal Rescue Foundation of Thailand*: Miss S K Christie (Member).
- Wildlife and Countryside Link*: Miss A M Dixon (Member, ZSL Representative; Vice-Chairman, Conventions Group).
- Zoo Outreach Organization, India*: The Zoological Society of London (Corporate Member).

CONSERVATION AND CONSULTANCY DIVISION



Dr Richard Kock and his team treat an injured giraffe in Kenya.

Miss Alexandra Dixon was confirmed as Director in July. Overseas, Dr Rob Brett completed his secondment to the Kenya Wildlife Service (KWS); he leaves a well-established and successful rhino programme which is a model for the rest of Africa. Dr Richard Kock continues on his secondment to KWS as Senior Veterinary Adviser. This post, 50% funded by the Overseas Development Administration, represents a lateral move for Dr Kock, enabling him to provide advice and assistance as required while allowing Kenyan counterparts to take on greater responsibility. CCD is now looking into ways in which our collaboration with KWS can be expanded into species restoration programmes.

In Saudi Arabia, Dr Nigel Brown left as Senior Veterinarian at the King Khalid Wildlife Research Centre to take up a post, also in the Kingdom, with the RSPCA. The Centre's activities continue to expand, particularly into genetic investigations and population surveys. Over 170 Idmi gazelles (*Gazella gazella*), including third generation wild-born individuals, are now found in the Hotat Bani Tamin Reserve and 100 Rheem (*G. subgutturosa*) have been released into Uruq Bani Ma'Arife, a new reserve established in the Rub Al-Khali, also known as the Empty Quarter. The Society's collaboration with the National Commission for Wildlife Conservation and Development is now in its ninth year and the Society remains committed to assisting with the restoration and management of the Kingdom's wildlife.

A major proposal for a four-year project in the Royal Chitwan National Park in Nepal was prepared and submitted for funding to the ODA. Consultancies were undertaken in Mauritius, Syria, Myanmar and Saudi Arabia. Funding applications for further projects in Zimbabwe, South Africa, The Philippines and Gibraltar have been prepared.

The Society remains very grateful to the Overseas Development Administration and Suzuki Cars (UK) Ltd for their continuing support.

Above Right: Touring the Royal Chitwan National Park by elephant - the Director of the Conservation & Consultancy Division, Miss Alexandra Dixon, visited Nepal to discuss possible future collaboration.



Right: The herd of Rheem gazelles released in 1995 into the Rub Al-Khali was built up by captive breeding; here a newborn calf finds its feet.



Black rhinoceros in the bush: Dr Rob Brett of the Society's Conservation & Consultancy Division has helped the Kenya Wildlife Service to conserve this endangered species.



Hyacinthine macaw: one of the stars of the new Macaw Aviary, opened in May 1994.

FINANCIAL PERFORMANCE

The summary accounts show a surplus of £319,000. However, this includes a capital donation of £925,000. The underlying deficit of £606,000 reflects depreciation previously charged directly to reserve, but now charged to operations. This change of accounting policy is explained in the Treasurer's Report. London Zoo has produced a small cash surplus which represents an improvement of over £450,000 on the preceding year, since the accounts in 1993/94 benefited from a most generous donation by the Society's Stamford Raffles Patron, Mr David Blackburn. Although Mr Blackburn continued to support the Zoo through sponsorship in 1994/95, his objective was to help it to stand on its own feet. The financial control and management of the Zoo have been strengthened during the year and this process is being continued with vigour, with the aim of producing strong annual surpluses.

THE COLLECTION

A year ago the Children's Zoo was closed and the area now occupied by the Macaw Aviary was a building site. By August, both sites had brand new exhibits, the first built at the Zoo since 1990. The Ambika Paul Children's Zoo was funded by a £1 million donation from Dr Swraj Paul, in memory of his daughter, and exhibits domestic animals from around the world, ranging from Bactrian camels, cows and pigs to pets such as mice and stick insects. A new Macaw Aviary was built using funds generated by the 1991 'Save Our Zoo' campaign and is intended to carry out two functions: first, to display macaws to their best advantage, in flocks, in an enclosure large enough for them to fly freely; and, second, to allow individual pairs to be separated off for breeding. In many ways, the latter is the more important function but it is aided by the increased fitness of the birds, resulting from the larger aviary, and the improved social bonding caused by allowing them to choose their own mates when housed as a flock. The

most important occupants of the aviary are six Hyacinthine macaws, which include two potential breeding pairs; others include Blue and Gold macaws, Moluccan cockatoos, and a pair of Military macaws.

London Zoo staff attended the Conservation Breeding Specialist Group annual meeting in Sao Paulo, Brazil; the Saigon Zoo Masterplan meeting in Vietnam; the South East Asian Zoo Association annual meeting in Hong Kong; the Third International Parrot Convention at Loro Parque in the Canary Islands; and the Population Viability Analysis meeting for Thai Gibbons in Bangkok. Involvement with regional conservation initiatives, e.g. for the Sumatran tiger and Thai gibbons, helps to keep the Society's international profile high.

Early in the year, the Zoo hosted a major workshop for the Action Plan for the conservation of the snail family Partulidae. This involved participants from the USA, Poland, Hawaii and Australia, as well as the UK. The result was the setting up of the Pacific Island Land Snail Group to co-ordinate conservation efforts for all Pacific Island snails. The *Partula* Action Plan was published in December.

In August, staff from the Invertebrate Conservation Centre took three species of captive-bred *Partula* snails back to Moorea in the Pacific for release into the world's smallest nature reserve, a fenced enclosure, designed to keep out the predatory snails responsible for the extinction of *Partula* in the wild. The whole effort was filmed by the BBC and was screened as an entertaining yet poignant Horizon programme in November. Of course, the reintroduction effort is at an early stage and there is still no obvious solution to the predatory snail problem, but the fact that there are, once again, wild *Partula* living on Moorea makes all the enormous effort so far expended worthwhile. Nearer to home, the Zoo continued to provide animals, and expertise, for the release of Field crickets and Wartbiter crickets into sites in Sussex and Kent, as part of the English Nature conservation programmes for these species. An English Nature grant allowed conversion of the old Marmot

enclosure into a Field Cricket study colony.

CERCI is a software package being developed at London Zoo, designed for managing and recording group-living species such as invertebrates and fish. The CERCI Species List has now been released to over 30 collections worldwide, and is well established as the animal record-keeping software for both the Aquarium and the Invertebrate House here at London. The CERCI *Partula* Module has been used extensively for analysing *Partula* demographic data.

Major work started in the Aquarium, with repairs to the leaking roof, and a complete rewire of the electrical system; the work is expected to take until the middle of next year. These repairs will make it possible for fundraising efforts for new Aquarium developments to be undertaken against a background of reasonable structural integrity.

The female Giant panda, 'Ming Ming', was returned to the Panda Breeding Station at Wolong, China, in October. During her three-year stay, she was never mated naturally by the male, 'Bao Bao', who was loaned from West Berlin Zoo. Attempts to get her pregnant by artificial insemination, using fresh semen from 'Bao Bao', failed and it seems possible that she is not fertile. There are no immediate plans to bring Giant pandas back to London.

Two species of cat were added to the collection during the year. A pair of Sand cats was received from the Society-run breeding station at Thumamah in Saudi Arabia. This is the first time that this species has been part of the collection since the 1960s. A pair of Margays was received from Edinburgh and Chester Zoos and they are now in the Clore Pavilion. The female Sumatran tiger, 'Mira', gave birth to three separate litters of cubs during the year, but no infants were reared. However, with each attempt, she improved her rearing skills, and it is hoped that she will rear her first cubs in 1995; her mother gave birth to five litters before rearing successfully.

Three Giraffes were born during one very hectic week in October, with one having to be hand-reared from birth, because he was apparently too tall to feed properly from his mother. The necessary milk supplies were



Sand cats, back at London Zoo for the first time since the 1960s.



Children encounter a stick insect at the Animals in Action show.

kindly donated by a local dairy. The Asian elephant cow, 'Mya', was sent to Chester Zoo for mating, but no pregnancy resulted and a rethink of our strategy for next year is required. The young Black rhinoceros pair successfully copulated on at least two occasions during the year, and hopes are high that a pregnancy will result during the next year or so. Other interesting mammal births included Hanuman langurs, a Chimpanzee, two Golden lion tamarins (the first since 1984), a Pudu and four Silvery marmosets. Two female Golden-headed lion tamarins were received from Hong Kong but, by the end of the year, both had died from complications associated with pregnancy.

The most notable hatchings in the Bird Department were the two Black-backed fruit dove chicks, a UK first breeding, but others of note were a Red-crowned crane, five Lilac-breasted rollers, a Spectacled owl, a Golden-headed mynah and a Gough Island moorhen. The latter bred within a month of being released into a large, planted aviary near the Bird House. A single Abdim's stork chick was parent-reared. This is the first hatching of this species at the Zoo since 1990. Other species bred included Black-footed penguin, Sacred ibis, Red-crested pochard, Edward's pheasant, Stone curlew, African harrier hawk, Grey-headed gull, Green imperial pigeon, Red-flanked and Fairy lorikeets, Slender-billed curlew and Livingstone's and White-cheeked turacos. The Zoo holds the UK studbook for the White-faced scops owl and so, as well as hatching six chicks, has been acting as co-ordinator for other moves of the species within the UK Joint Management Programme. Three pairs of Black-cheeked lovebirds were donated to the Zoo by the Lovebird Society. This species is now endangered in the wild, and the Lovebird Society has undertaken to try to preserve a stock of wild-type birds in captivity. HM Customs also made a number of donations to the Zoo including five Goffin's cockatoos, eighty-six Horsfield's tortoises (now mostly relocated), four West African burrowing pythons and a number of other reptiles. From a private donor, we received a pair of the

critically endangered Philippine Red-vented cockatoo. The Reptile House received a pair of Serpent Island geckos from the Jersey Wildlife Preservation Trust; the natural habitat of this species is a dome of rock about 300 m in diameter near Mauritius in the Indian Ocean. A captive population has been established as a precaution against catastrophe and to try to find out more about the reproductive biology of the species.

The Reptile Department hatched a single Greater plated lizard and five Stinkpot terrapins, as well as the usual selection of commoner species. The most interesting hatchings in the Aquarium were two Thornback rays, which have since proved relatively easy to rear. Ten juvenile Mississippi paddlefish were received. Interesting donations to the Invertebrate House included five highly toxic spiders of the genus *Phoneutria* from Brazil. All were females and one hatched a large number of young in December.

A major departure during the year was the trio of Bruijn's echidna, which have been sent to Taronga Zoo in Sydney. Although they had been in London for many years, they had never reproduced and it was felt that they might stand more chance of doing so in the custom-built accommodation at Taronga, where the only other specimen in captivity was held.

At the Zoo Federation AGM held in Edinburgh in May, meritorious awards were



Notable hatchings in the Reptile House included the Stinkpot terrapin.

received for the Field Cricket reintroduction work; sustained breeding of the Stephen's Island tree weta; and for the development of the CERCI computer programme.

EDUCATION

The start of 1994 saw intensive preparation in the Education Department for the 'Extinction' exhibition; besides labels for extinct species, panels were produced giving a strong conservation message about saving endangered species from extinction, and two resource packs for Primary and Secondary teachers were prepared.

A key educational project was the development of interpretative material for the new Children's Zoo and the Pet Care Centre. The need for responsible pet care is graphically brought out in large coloured panels covering correct feeding, care and social grouping. The theme of domestication continues through the Children's Zoo; carved wooden and stone animals displaying a number of colourful interactive devices, designed to encourage observation, were instantly popular with young children, particularly the animal sounds.

In other parts of the Zoo, new interpretation has included 'Conservation in Action' panels for tamarins, Arabian oryx and Field crickets, and basic labels for many new species.

The new souvenir guide book was launched in the summer; though its contents were well received, a survey showed that visitors were put off by having a reptile on the front cover, with the result that it has been replaced by something furry! Copies were bought by one in twelve visitors.

June saw a very successful day of events for children with special needs and their families; sign language interpreters provided visitors with hearing impairment the opportunity to enjoy all the usual daily events. Improved access to the Reptile House was the first example of implementing a recent in-house report on access and visibility for disabled visitors.

School attendances rose by 6,000 during the summer term and by 2,000 during the Autumn. New resource packs for teachers included Behavioural Studies for A-level, Conservation for Key Stages 2 and 3 and several new observation trails. April saw the Teachers' Open Day and the Zoo's first Conservation Symposium for A-level students, which proved very successful; the day comprised talks on biodiversity and captive breeding programmes and workshops around the Zoo.

Many new recruits were added to the corps of Volunteers and a new tour, entitled 'The London Zoo Story', was written for the new season, to be offered daily to visitors.

Education staff and Volunteers were saddened by the death, in June, of Barbara Moir who had led the Thursday team and helped to run the Public Information Service which answers over 300 letters a month from the public.

Several activities were arranged for junior Lifewatch members (Explorers), including nestbox-making and Christmas activities, and the popular 'Muck-in, Muck-out' days, where children help keepers.

A new system of monitoring the Zoo's



Life-size animatronic models of dinosaurs reminded visitors to the Extinction Exhibition that species can indeed disappear from the earth for ever.

service to customers was set up, providing feedback on the areas which come under criticism most often.

MARKETING & PUBLIC RELATIONS

The key objectives for the Marketing and Public Relations Department were to consolidate the work of 1993 and to place London Zoo firmly in the public's mind as a leading animal conservation organisation, which is also a great place to visit. The aim was not only to generate significantly increased visitor numbers, but also to convert a greater proportion than previously to become members of Lifewatch. Both these were achieved: 11% more visitors than the previous year, and over 21,000 Lifewatch members!

Continuing under the banner 'Conservation in Action', all marketing activity focused on the year's two big attractions. These were the Extinction Exhibition, which ran from May to September, and the Children's Zoo, which opened on 1 August.

Advertising and PR was aimed primarily at children, with advertising spend focused on media to which children are responsive. A new poster advertising campaign, which featured a wide range of animals, was developed by the advertising agency, Harari Page. A 'Zoo rap' was produced as a TV commercial, the theme of which was continued on bus-sides, underground posters and small space press advertisements. Marketing research undertaken in the summer indicated high levels of recognition of all the advertising media used.

Effective media buying and help from sponsors enabled excellent value to be obtained from advertising spend. With help from Esso and a gift of free poster sites at Gatwick and Heathrow, around £150,000 worth of poster advertising was obtained. A series of press advertisements was produced with the headline 'Dead Parrots Are Not Funny' and was placed in opinion-forming newspapers and journals, in an effort to establish further the important conservation

work of London Zoo and other good zoos. Strong public relations efforts helped to ensure that London Zoo's public image grew significantly, with plenty of excellent high-profile coverage in the national media, aided by Animal Management Staff offering 'expert' advice. Notable stories included: the return of 'Ming Ming' to China, the opening of the Children's Zoo, the Extinction Exhibition, 'Arfur' the lion's illness and death, and the Children's Committee. Swift response by staff on the occasion when a man climbed into the lions' enclosure saved his life; consequently the considerable media coverage of the incident was on the whole positive.

All the advertising and PR effort worked hard to counter the several publicity campaigns by the anti-zoo lobby. London Zoo took a proactive role in debating and promoting the role of zoos by hosting a

televised debate for the BBC 2 series called 'State of the Ark', and putting up spokesmen to answer questions about that role. The Zoo was promoted at a number of trade exhibitions throughout the year, the largest of which was the Ideal Home Exhibition in April, followed by the British Travel Trade Show, Excursions, and the BBC's 'The Big Bash' (an exhibition for young people).

Joint promotional activity continued to expand. A conservation competition with Tipp-ex was distributed to over 26,000 schools, and an on-pack offer on Weetos of animal adoptions generated over £35,000 in income. The largest joint promotion was for 'The Lion King' with Disney, in which a Lion King trail was put up in the Zoo, a trail leaflet was produced with competitions and a cinema trailer which promoted London Zoo's work with Asiatic lions was shown to an estimated audience of 2 million. A calendar for 1995 was produced at no cost to the Society and featured photographs by a professional photographer, who is also a Lifewatch Member.

Animal Adoptions continue to be extremely popular (despite an unexpected lack of take-up in Adopt an Animal Week). Key corporate adopters in 1994 were: Esso, Nationwide Building Society, Antony Cook Associates, Transitions Optical and Stampex. In the summer a new-look Lifewatch magazine was produced.

DEVELOPMENT

Foundations were laid by the London Zoo Development Department for the major capital fundraising campaigns essential to the future development of the Zoo. Detailed costings of individual projects were prepared and experienced staff recruited. In a detailed strategy for fundraising, the need to underpin Zoo finances by addressing revenue costs and to establish a substantial Endowment Fund have also been identified. In the meantime, around £300,000 has been collected in miscellaneous donations and gifts in kind, and from special events.



Asiatic lions; only a few hundred survive in the wild but London Zoo is co-operating in the captive breeding programme.



Animals in Action: a member of the audience helps to demonstrate how a rat boards a ship.

EVENTS

The daily programme co-ordinated by the Events Department continued to be a popular attraction for Zoo visitors, as well as a means of informing them about the Zoo's conservation work. One of the highlights of the 'Animals in Action Programme' involved flying 'Max', the Eagle owl, low over the heads of the audience - an experience denied later visitors after 'Max' damaged a talon and had to be withdrawn from shows. New arrivals to the section during the year included 'Major', a 21-year-old Blue and Gold macaw donated to the department, and two male ferrets. Losses included 'Bandit' the rat; following his death his understudy, 'Basil', took over, demonstrating the way rats have travelled around the world by boarding ships. Through the spring and summer terms there was a significant increase in bookings from schools for the specially-modified versions of 'Animals in Action', conducted in the Lifewatch Centre.

Following the acquisition last year of a pair of Black kites, the department introduced a new daily event. Flying the kites took place on the Riding Lawn, accompanied by a commentary which included an account of the reintroduction of the Red kite to England - a near-extinction story to suit the theme of this year's major exhibition. The Events section staff were involved in the filming of the Carlton TV series '99-1'. For her role, actress Frances Tomelty learned to fly kites and owls, and the personal interest she took in this resulted in her participating in the public presentations at weekends in the summer.

The Event Co-ordinator was heavily involved in the planning and running of 'Extinction'. This exhibition explained the causes of past extinctions, looked at some of the casualties, and warned of the threat to many living species, some of them exhibited in the Zoo. It featured life-sized animatronic models of extinct animals, from a full-sized *Tyrannosaurus rex* to a baby mammoth, together with museum specimens and other items. Specially-produced graphics and a commissioned video told the story, while a passport system was devised to encourage the public to visit the exhibition sites around the

Zoo. 'Extinction' succeeded in its treatment of the subject, though it attracted fewer additional visitors than had been anticipated.

GENERAL SERVICES

The completion of the Macaw Aviary signified the first positive development in the Zoo since the launch of the Business Plan. The first major capital project, The Ambika Paul Children's Zoo, was completed in August. Following the busy summer season the Ambika Paul Memorial Gardens, which include the Children's Zoo and a fountain dedicated to Ambika, were opened by Dr Swraj Paul, on 12 November.

In June, a 'Storacall' Voice Management system was added to the telephone network to help to improve efficiency. Unfortunately, this proved less successful than had been hoped and alternative systems are being explored. The Closed Circuit Television System around the Zoo was upgraded in order to provide a time-lapse record simultaneously from those cameras with night vision.

The Grounds Section was incorporated within the General Services Department and some working practices were amended to improve the standard of cleanliness in the visitors' toilets.

The Golden lion tamarin outside enclosure within the Sobells, upgrading of the Main Toilets, maintenance and painting of the Clock Tower, building a new Children's Playground, installing a kiosk near the Clore Pavilion and upgrading offices and security windows in the Nuffield Building were just some of the projects undertaken during the year.

£50,000 was spent on the heating systems throughout the site, the majority on upgrading the 'Trend' control system to initiate further savings in energy. Other tasks included a new heating system in the plant nursery, installation of additional lagging in the Aquarium and Reptile House, and upgrades in the Main Office and Regent Building.

Messrs Kawasaki kindly increased their sponsorship of the vehicles used by the Department, and are now providing a fleet of four Kawasaki trucks, two of which are licensed for road use.

The Gardeners were involved in the planting of the New Children's Zoo, including

the reinstatement of two lawns. The high standard of presentation of the formal flower beds and rose gardens was maintained.

RETAIL

In the Retail Department, turnover was 20% up on the previous year, partly because of the success of the Extinction Exhibition Shop which produced an average spend of 12p per head. Operating expenditure was kept to a minimum, resulting in higher surpluses than originally projected. Retail concessions such as face-painting, coin-operated rides and customised badges contributed some £65,000 in commission, an increase of 30% on the previous year.

CATERING

Although the catering year for Digby Trout Restaurants started badly with snow and appalling weather at Easter which affected the number of visitors to the Zoo, business picked up steadily throughout the summer months. Spend per head was, however, lower than anticipated, partly because of the skewed-from-target visitor mix, and partly because facilities were closed for three months for kitchen refurbishment. The full refurbishment of the Fish and Chips kiosk, the Pizza outlet, Sandwich Bar and Regent Cafe kitchen took place on schedule and two new ice cream kiosks were opened for the season. Mobile ice cream vendors, popcorn and barbecues all did well over the summer period. Pepsi Lion Cub lunch boxes were shown to be extremely good value for money and will continue for 1995. Comments received from regular visitors have indicated appreciation of the change, under the new management contract, from frozen, pre-processed food to freshly prepared meals and snacks and a general perception of improved food quality is developing at the Zoo.

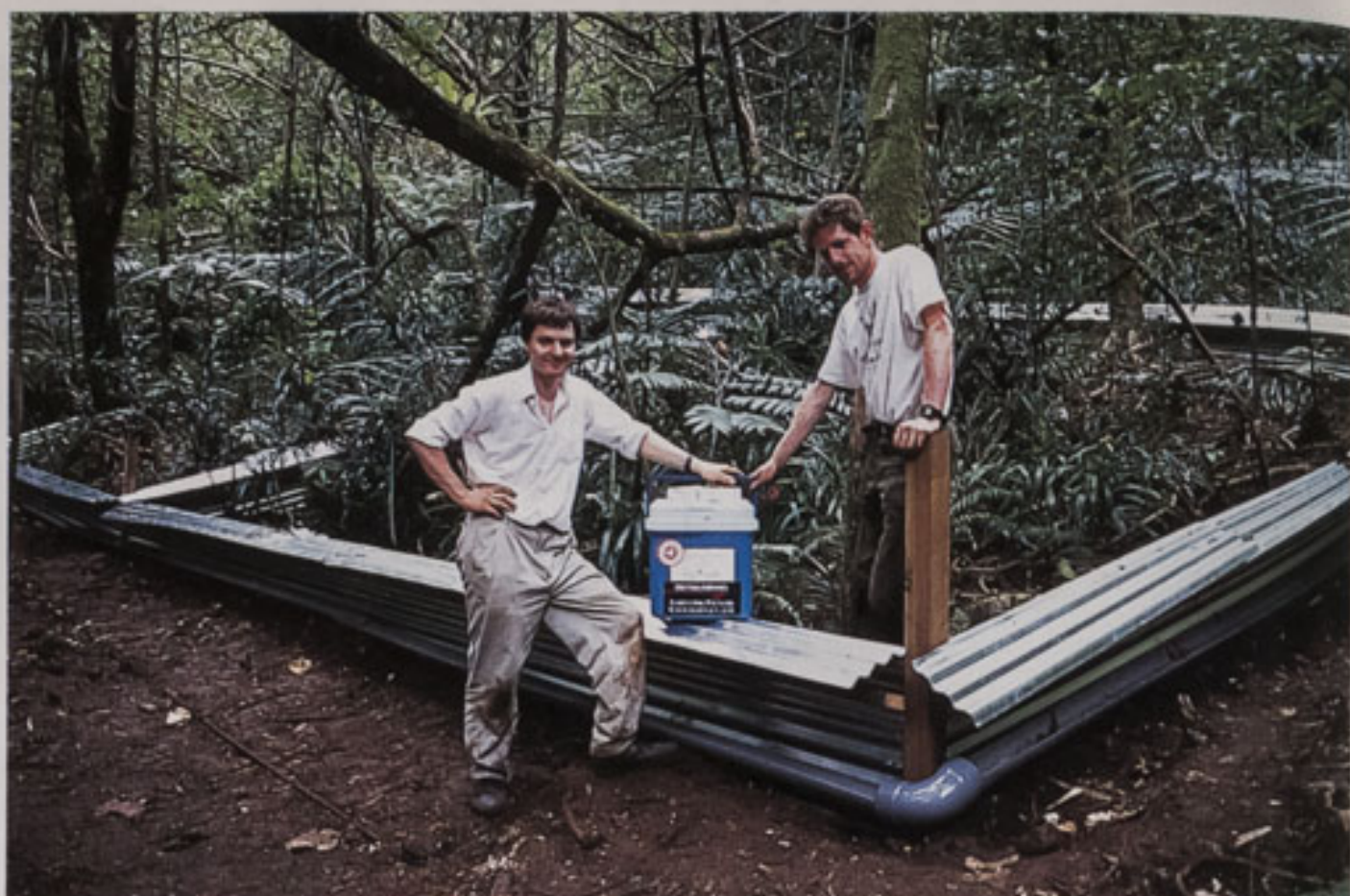
After two quiet months at the beginning of the year, the banqueting function undertaken by Letheby and Christopher witnessed a dramatic rise in business. This can be attributed partly to a new marketing campaign which strives to ensure that London Zoo becomes one of the country's premier conference and banqueting venues. The Regency Suite refurbishment was completed in February.



The newly redecorated Regency Suite, set up ready for the Donors' Reception held in March 1995.



Black cheeked lovebird; London Zoo is helping to conserve a stock of this species, endangered in the wild.



The world's smallest nature reserve, on Moorea in the Pacific, where captive-bred Partula snails were reintroduced by London Zoo's Invertebrate Conservation Centre.



The New Children's Zoo, with the Penguin Pool in the foreground.



The Black & white ruffed lemur shows its climbing skills at the Animals in Action show.



The London Zoo Bus.



Regal tang in the Aquarium.



Bill Oddie, visiting Whipsnade to launch the Falklands Penguin Appeal, pictured with young Humboldt's and Rockhopper penguins.

The summary accounts show a surplus of £951,000. Although £740,000 of this relates to the proceeds of the buildings insurance claim following the fire in 1993, the balance represents a very substantial improvement on the previous year's performance. Adverse weather conditions over Easter created a 20,000 shortfall in visitor numbers, but the deficit was clawed back with a series of special initiatives. These went hand in hand with the development of a marketing strategy building on shoulder months through a special events programme.

THE COLLECTION

The development of a ten-year plan for Whipsnade has led to much discussion on the present collection, new exhibits and species selection for the future. The next few years will see a period of consolidation of the collection with new species and developments fitting into the ten-year plan.

A new stable and paddock for the Nile lechwe was completed and the old Children's Zoo was re-opened for Easter 1995 as the new Bird Garden. This area gives the visitor a chance to see some of the techniques involved in breeding and rearing birds, including egg incubation and chick hand-rearing. The birds used in the Flying Bird Display are also visible whilst at rest.

The Dwarf crocodile area was commissioned and the adult pair gave it a seal of approval by mating in it. Five more young hatched in 1994, repeating the success of the first year.

The giraffes continued to breed well with one of the females managing to rear a calf successfully herself. Other notable breeding successes were five Przewalski's horses, a Bongo, two Roan antelope, Nile lechwe, nine Scimitar-horned oryx, dwarf buffalo and many deer species. The Pygmy hippo female who had previously failed to rear her young produced a calf which she reared successfully.

However, the birth which promoted the best international press response was that of the 42nd White rhino. The female calf was

born at the end of November, just right for publicity over the Christmas and New Year period. The extensive coverage prompted great response from the public in a competition to name the calf; the winning name was 'Makolibu', after a South African ranger who had devoted his life to the conservation of White rhinos. Two young male White rhino were placed in collections to start new herds.

There was disappointment earlier in the year when the two Brolga crane chicks failed to survive. This was particularly unfortunate as it was the first time that both eggs in the clutch had proved to be fertile. However, the Stanley cranes maintained their excellent breeding record. All three species of penguin bred and the Scarlet ibis had another good year, with one pair being encouraged to rear their own chicks successfully for the first time. Those species new to Whipsnade were all to be found in the Discovery Centre.

Customs confiscations provided animals which included Horsfield's tortoises, Sand boas, Red-sided skinks, *Phelsuma* geckos and South American tree frogs. Developments within the Discovery Centre should increase the diversity of species to be seen by the public and a new outside run for the tortoises is in preparation.

CONTRIBUTIONS TO THE ZOO COMMUNITY

Whipsnade staff continue to play a major role within the Federation of Zoological Gardens of the United Kingdom and Ireland. Stuart Earley, Chief Executive of Whipsnade, was elected Treasurer of the Federation during the year and Nick Lindsay, Curator of Whipsnade, is a member of the Federation Conservation and Animal Management Committee and Joint Management of Species Committee. Nick is also Chairman of the UK Rhino Taxon Advisory Group (TAG) and Co-Chairman of the Crane TAG. The Senior Education Officer, Margaret Williams, sits on the Federation



'Jose' produced and successfully reared her second calf, named Jobe, after a competition run through the national press.



Przewalski foals enjoying the spring sunshine.

Education Committee, and was part of a sub-committee looking at the needs for a zoo educator qualification. She also helped to plan the programme for the 1994 Zoo Educators' Conference in Jersey, and is looking into the feasibility of sharing information between collections to produce Federation leaflets on a number of subjects. Whipsnade organised the Federation Education Regional meeting.

OVERSEAS ACTIVITIES

Whipsnade continues to support two major overseas programmes: the Ghana joint management programme under the auspices of its Game & Wildlife Department, and the Great Bustard Conservation programme. Clive Bates, Deputy Co-ordinator of the Asian Region, was appointed Secretary of the Great Bustard Trust, in which captive breeding has an important role to play in the conservation of this once indigenous species.

EDUCATION DEPARTMENT

Phase one of the graphics programme - labelling the enclosures with the A3 graphics - was completed. A graphics plotter was purchased which enables vinyl lettering to be cut and so produce 'facts' boards on foamboard or wood.

COPUS (Committee on the Public Understanding of Science) gave a grant of £1,500 to buy tools and materials to begin a programme of interactive interpretation, including the 'Survival Game' beside the White rhino house.

'Activity Bags' using skins damaged in the

restaurant and education centre fire were produced and a Volunteer, Mary Snoxall, and other members of the Thursday team painted silhouettes of animals on the entrance fencing from an idea by Henry Jackson.

During the summer, Graham Lucas gave his popular 'Animal Talks' for the general public at various locations around the Park.

MARKETING & PUBLIC RELATIONS

Despite more aggressive competition from Woburn Safari Park - only 12 miles away - and a reduced, but more effective marketing expenditure, the number of visitors to Whipsnade exceeded the budgeted target.

Christmas Wonderland again proved very successful. A much enhanced Grotto, including an enchanted forest, arctic cave, penguin pool and Christmas village, attracted over 10,000 advance bookings and generated considerable extra revenue. The Countryside Day special event organised in connection with the local authority and the community helped to boost visitor numbers in September at the end of the Summer season. A Medieval Fayre, complete with Knights and their Ladies, and jousting, will be repeated and expanded next year. The Steam Weekend was bigger and better than ever before - so much so that queues of traffic trailed back to the M1, forcing closure of the Park to cars. The now traditional favourites of Easter Egg Hunt, Teddy '94, WWF Sponsored Walk and Kids Out with Rotary were repeated.

A half-price admission experiment was put

on trial from November to February, excluding Christmas Wonderland. It did not attract the large number of visitors hoped for, and catering and retail expenditure was also lower. This experiment did, however, prove the inelastic nature of admission price and this will be borne in mind in setting future pricing policy.

Radio coverage was extensive, with Chiltern, Hot FM and BBC Radio all running animal stories and featuring WWAP personnel on discussion programmes. Television coverage included BBC 1's Newsround featuring the Dwarf crocodiles; GMTV and LWT featuring the new White rhino calf, and London Tonight with an article on breeding at WWAP.

Development of links with the local community was further enhanced with the completion of the new function suite and its relaunch. Mr Roger Smith, a local resident and member of the Whipsnade Board, has proved an invaluable link in developing these contacts.

Customer Care Seminars were being held for all full time and seasonal staff, focusing on the needs of the customer. A special Customer Care line has been established to send visitors literature in advance of their visit.

CAFE ON THE LAKE AND THE FUNCTION SUITES

Building works on these two key facilities were completed following the fire in 1993, although a frustrating three-month delay was experienced early in the year due to the designers misunderstanding their brief and

exceeding substantially the estimated cost of the project. The Cafe on the Lake has been quadrupled in size and can accommodate 140 seated customers - more than the old day visitor restaurant and Cafe combined. Full disabled access has been provided and the Cafe affords marvellous views across one of the most beautiful parts of the Park, taking in Tiger Falls, the Asian Drive Through, the Black rhinos and Lake Daedalus. The Ibis Aviary has also been extended so that half the restaurant appears to be inside the aviary. The two new function suites can accommodate 200 people in each in banqueting format or combine to provide a room that can cater for up to 400. This is now one of the biggest facilities in the region and bookings to date are ahead of schedule.

PARK INFRASTRUCTURE

Considerable re-investment has taken place around the Park in the last year. Toilets have been upgraded and there are now four Parent and Baby rooms at different locations around the Park. Major renovations have taken place at the African Lookout and the accompanying toilet blocks. The White Rhino House, Sealion House, Hippo House, Flamingo House, Camel House and Oryx House have all been refurbished as part of the rolling programme. The drainage in the Children's Farm has been upgraded to provide more hard standing for animals and to create an area where children and animals can roam together in relative freedom. The Railway has undergone considerable refurbishment and upgrading with some 20% of existing railway sleepers replaced and new ballast installed. The three steam engines themselves have each had a major overhaul and the Railway as a whole is now a credit to the Park. The entrance courtyard has been laid with brick pavers and the refurbishment of the gates has created a new ambience for the whole area. Major alterations were made to the Cashiers' Office, necessitated by new insurance requirements, the opportunity being taken to upgrade the kiosks.

The Environment Enrichment Group within the Park, chaired by Andy Reeve, provides for an even greater environment enrichment for the animal collection. The British Wildlife Group - chaired by Mark Best - focuses on the native British wildlife in the Park and works closely with local wildlife groups on both fauna and flora.

The recently established Customer Experience and Development Group is charged with ensuring that a visit to Whipsnade is an experience that constantly improves.



A fifth calf for 'Trio', a white rhino. This winter calf was christened 'Makolibu'.



Steam Weekend, Whipsnade's busiest event, was on the May Day Bank Holiday weekend.

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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Professor R McNeill Alexander
SECRETARY

ANIMALS IN THE COLLECTIONS

Key to columns for Mammals, Birds, Reptiles and Amphibians:

column 1	Number of animals in the Collection at 1st January 1994.
column 2	Number of animals received in 1994 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 1994.
column 4	Number of animals which died in 1994 within 30 days of birth or hatching. The figures in brackets indicate animals born or hatched during December 1993 which died during January 1994. Stillbirths are not included.
column 5	Number of animals which died from natural causes during 1994, apart from those included in column 4.
column 6	Number of animals disposed of in 1994 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 1994 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	*Species subject to the Agreement with the Marswell Preservation Trust on joint ownership and management	**Free-ranging animals at Whipsnade censused once a year
S	Species new to the Collection		
SS	Sub-species new to the Collection		

IUCN threatened species categories

Birds only. *Birds to Watch 2. The World List of Threatened Birds (1994)*. Bird Life International, Cambridge, UK. All other species. *1994 IUCN Red List of Threatened Animals*. Compiled by World Conservation Monitoring Centre, Cambridge, UK.

C	Critically endangered	I	Indeterminate	R	Rare
E	Endangered	K	Insufficiently known	V	Vulnerable
Ex	Extinct <i>in situ</i>				

LONDON ZOO

	1	2	3	4	5	6	7
MAMMALS							
Monotremata							
<i>Tachyglossus aculeatus</i>	Australian Echidna	1	-	-	-	-	1/0
<i>Zaglossus bruijnii</i> (E)	Bruijn's Echidna	3	-	-	-	3	-
Marsupialia							
<i>Phalanger gymnotis</i>	Grey Ground Cuscus	4	-	-	-	-	2/2
<i>Gymnobelideus leadbeateri</i> (E)	Leadbeater's Possum	5	1	-	-	1	3/1
<i>Petaurus breviceps</i>	Sugar Glider	8	-	-	-	2	3/3
<i>Dasuroides byrnei</i> (E)	Byrne's Pouched Mouse	2	12	-	-	-	7/7
<i>Potorous tridactylus</i>	Long-nosed Potoroo	5	1	2	-	1	4/3
<i>Macropus rufogriseus fruticosa</i>	Red-necked (Bennett's) Wallaby	4	-	1	-	-	2/3
Insectivora							
<i>Erinaceus europaeus</i>	European Hedgehog	1	-	-	-	1	-
<i>Suncus murinus</i>	Grey Musk Shrew	1	2	8	-	1	1/6/3

	1	2	3	4	5	6	7
<i>Myoprocta pratti</i>	Green Acouchi	5	-	2	1	-	2/3
<i>Chinchilla laniger</i>	Chinchilla	4	-	5	1	-	3/1/2
<i>Octodon degus</i>	Degu	2	-	-	-	1	-
<i>Hydrochaeris hydrochaeris</i>	Capybara	-	3	-	-	-	1/2
Carnivora							
<i>Canis lupus</i> (V)	Grey Wolf	3	-	-	-	1	1/1
<i>Fennecus zera</i> (K)	Fennec Fox	3	-	-	-	-	1/2
<i>Ailuropoda melanoleuca</i> (E)	Giant Panda	1	-	-	-	1	-
<i>Ictonyx striatus</i>	Zorilla	4	-	3	-	-	1/1
<i>Martes martes</i>	Pine Marten	1	-	-	-	1	-
<i>Amblyonx cinerea</i> (K)	Oriental Small-clawed Otter	2	-	-	-	-	1/1
<i>Genetta tigrina</i>	Blotched Genet	2	-	-	-	-	1/1
<i>Arctictis binturong</i>	Binturong	2	-	-	-	-	1/1
<i>Saricata suricata</i>	Suricate Meerkat	2	-	-	-	1	-
<i>Helogale parvula</i>	Dwarf Mongoose	10	-	-	-	1	1/2/6
<i>Mungos mungo</i>	Banded Mongoose	2	-	2	1	-	1/2
<i>Cynictis penicillata</i>	Yellow Mongoose	5	-	-	-	5	-
<i>Felis caracal</i>	Caracal Lynx	1	-	-	-	-	0/1
<i>Felis margarita harrisoni</i> (K)	Sand Cat	-	2	-	-	-	1/1
<i>Felis pardalis</i>	Ocelot	4	3	-	-	1	1/1
<i>Felis wiedii</i> (K)	Margay	-	2	-	-	-	1/1
<i>Panthera leo persica</i> (E)	Asiatic Lion	9	-	-	-	2	5/2
<i>Panthera tigris sumatrae</i> (E)	Sumatran Tiger	2	-	6	6	-	1/1
<i>Panthera pardus saizicolor</i> (I)	Persian Leopard	2	1	-	-	1	1/1
<i>Neofelis nebulosa nebulosa</i> (V)	Clouded Leopard	2	1	-	-	1	1/1
Pinnipedia							
<i>Arctocephalus australis</i>	South American Fur Seal	1	-	-	-	1	-
Proboscidea							
<i>Elephas maximus</i> (E)	Asian Elephant	3	1	-	-	1	0/3
Perissodactyla							
<i>Equus burchelli antiquorum</i> *	Chapman's Zebra	2	1	-	-	-	1/2
<i>Diceros bicornis michaeli</i> (E)	Black Rhinoceros	2	-	-	-	-	1/1
Artiodactyla							
<i>Pudu pudu</i> * (K)	Pudu	3	-	1	-	1	2/1
<i>Okapia johnstoni</i>	Okapi	1	-	-	-	-	1/0
<i>Giraffa camelopardalis</i> *	Giraffe	4	-	3	-	-	3/4
<i>Tragelaphus strepsiceros</i> *	Greater Kudu	6	-	3	1	-	1/5
<i>Bubalus depressicornis</i> * (E)	Anoa	8	-	-	-	2	2/4
<i>Oryx leucoryx</i> * (E)	Arabian Oryx	6	-	-	-	1	1/4
<i>Gazella gazella arabica</i> (V)	Arabian Gazelle	3	1	-	-	1	0/1
Domestic							
	Rabbit	11	2	5	-	4	7/7
	Guinea Pig	11	-	-	-	3	1/7
	House Mouse (domestic)	-	8	15	-	3	0/2/15
	Brown Rat (domestic)	22	13	47	-	3	12/6
	Clawed Bird (domestic gerbil)	-	6	-	-	-	6/0
	Polecat Ferret	-	2	-	-	-	2/0
	Pony: Cream	-	2	-	-	-	2/0
	Dartmoor	-	1	-	-	-	0/1
	Welsh	-	2	-	-	-	1/1
	Shetland	-	1	-	-	1	-
	Llama*	2	-	-	-	-	2/0
	Bactrian Camel*	-	4	-	-	-	0/3
	Reindeer	3	2	-	-	2	0/3
	Pig: Berkshire	-	1	8	2	-	1

	1	2	3	4	5	6	7
Chiroptera							
<i>Pteropus rodricensis</i> (E)	Rodriguez Fruit Bat	22	-	11	6	3	14/10
<i>Carollia perspicillata</i>	Seba's Short-tailed Bat	207	-	31	23	33	0/0/174
Scandentia							
<i>Tupaia minor</i>	Pygmy Tree Shrew	2	2	2	-	2	2/2
<i>Tupaia tana</i>	Large Tree Shrew	3	-	-	-	-	1/2
Primates							
<i>Eulemur macaco macaco</i> (V)	Black Lemur	2	-	-	-	-	1/1
<i>Eulemur fulvus mayottensis</i> (V)	Mayotte Lemur	3	-	-	-	-	3
<i>Varecia variegata variegata</i> (E)	Black-&-white Ruffed Lemur	1	-	-	-	-	0/1
<i>Varecia variegata rubra</i> (E)	Red Ruffed Lemur	3	1	-	-	-	2/2
<i>Chiropotus medius</i>	Fat-tailed Dwarf Lemur	8	-	-	-	-	2/2
<i>Microcebus murinus</i>	Grey Mouse Lemur	4	-	-	-	-	4
<i>Loris tardigradus</i>	Slender Loris	4	-	-	-	1	3/0
<i>Nycticebus coucang</i>	Slow Loris	3	3	1	-	-	2/4
<i>Nycticebus pygmaeus</i> (V)	Pygmy Slow Loris	3	-	-	-	-	1/1
<i>Galago senegalensis</i>	Senegal Bushbaby	2	1	-	-	-	2/1
<i>Aotus trivirgatus</i>	Douroucouli	-	2	-	-	-	1/1
<i>Aotus trivirgatus bolivianus</i>	Douroucouli (Bolivian)	2	-	-	-	-	1/1
<i>Pithecia pithecia</i>	White-faced Saki Monkey	6	-	-	-	-	3/3
<i>Ateles paniscus paniscus</i> (V)	Red-faced Black Spider Monkey	3	-	-	-	-	1/2
<i>Callithrix jacchus</i>	Common Marmoset	-	6	3	1	-	2/2/4
<i>Callithrix argentata argentata</i>	Silvery Marmoset	4	-	4	1	-	2/4/1
<i>Cebuella pygmaea</i>	Pygmy Marmoset	6	-	2	1	2	3/2
<i>Saguinus oedipus</i> (E)	Cotton-headed Tamarin	4	-	-	-	-	3/1
<i>Saguinus imperator</i>	Emperor Tamarin	2	-	4	3	1	1/1
<i>Leontopithecus rosalia</i> (E)	Golden Lion Tamarin	8	1	2	-	2	3/5/1
<i>Leontopithecus chrysomelas</i> (E)	Golden-headed Lion Tamarin	2	2	-	-	2	2/0
<i>Callimico goeldii</i> (R)	Goeldi's Monkey	8	-	3	3	-	2/3
<i>Macaca nigra</i> (I)	Sulawesi Crested Macaque	8	1	2	1	-	1
<i>Cercopithecus diama diama</i> (V)	Diana Monkey	2	-	-	-	-	1/1
<i>Cercopithecus hamlyni</i> (V)	Hamlyn's Owl-faced Monkey	4	-	-	-	-	2/2
<i>Colobus polykomos polykomos</i>	Western Black-&-white Colobus Monkey	2	3	1	1	-	2
<i>Presbytis entellus thersites</i>	Hanuman Langur	5	2	2	-	1	3/5
<i>Hyllobates lar</i>	Lar Gibbon	4	-	-	-	-	2/2
<i>Pan troglodytes</i> (V)	Chimpanzee	13	-	1	-	-	4/30
<i>Gorilla gorilla gorilla</i> (V)	Western Lowland Gorilla	3	-	-	-	-	1/2
Xenarthra (Edentata)							
<i>Choloepus didactylus</i>	Two-toed Sloth	2	-	-	-	-	1/1
Rodentia							
<i>Callosciurus prevostii</i>	Prevost's Squirrel	5	-	4	-	1	6
<i>Tamias leucisendii</i>	Townsend's Chipmunk	3	-	-	-	1	1/1
<i>Tamias sibiricus</i>	Siberian Chipmunk	5	-	3	-	3	2/3
<i>Peromyscus polionotus</i>	Oldfield Mouse	2	-	-	-	2	-
<i>Phodopus sungorus</i>	Dwarf Hamster	19	-	15	-	11	7
<i>Cricetulus barabensis</i>	Chinese Hamster	15	-	4	-	-	8
<i>Gerbillus perpallidus</i>	Pallid Gerbil	33	-	3	3	5	-
<i>Apodemus sylvaticus</i>	Field Mouse	41	-	4	-	21	4
<i>Micromys minutus</i>	Harvest Mouse	4	-	-	-	2	-
<i>Acomys rufus</i>	Golden Spiny Mouse (Black form)	16	2	2	-	2	-
<i>Rattus rattus</i>	Black Rat	21	-	88	-	2	89
<i>Dryomys nitidula</i>	Forest Dormouse	13	-	-	-	1	-
<i>Muscardinus avellanarius</i>	Common Dormouse	6	2	-	-	4	-
<i>Hystrix africanus</i>	Cape Crested Porcupine	2	-	-	-	-	1/1
<i>Atherurus africanus</i>	African Brush-tailed Porcupine	7	-	3	-	-	2
<i>Dasypus punctata</i>	South American Agouti	19	-	7	5	1	7

	1	2	3	4	5	6	7
<i>Tamworth</i>		-	1	-	-	-	0/1
<i>Middle White</i>		-	7	-	-	1	6
<i>Red Poll</i>		-	5	-	-	-	0/5
<i>Leicester Longwool</i>		-	3	-	-	-	0/3
<i>Norfolk Horned</i>		-	3	-	-	-	0/3
<i>Anglo-Nubian</i>		-	3	-	-	-	0/3
Total: Mammals	760	121	313	60	124	269(1)	741

BIRDS

	1	2	3	4	5	6	7
Sphenisciformes							
<i>Spheniscus demersus</i>	Blackfooted (Jackass) Penguin	45	6	12	1	1	20
Pelecaniformes							
<i>Pelecanus onocrotalus</i>	Eastern White Pelican	4	2	-	-	-	2/3/1
<i>Pelecanus occidentalis thagus</i>	Brown Pelican	1	-	-	-	-	1
<i>Morus bassanus</i>	Gannet	3	-	-	-	-	3
Ciconiiformes							
<i>Nycticorax nycticorax</i>	Night Heron	3	-	-	-	-	0/1/2
<i>Ardea ibis</i>	Cattle Egret	10	-	1	-	1	1/2/7
<i>Ardea cinerea</i>	Grey Heron	2	-	-	-	1	0/0/1
<i>Ciconia abdimii</i>	Abdim's Stork	8	-	1	-	-	2/4/3
<i>Leptoptilos crumeniferus</i>	Marabou Stork	2	-	-	-	2	-
<i>Threskiornis arthropicus</i>	Sacred Ibis	29	-	11	3	3	0/0/34
<i>Eudocimus ruber</i>	Scarlet Ibis	5	-	-	-	-	3/2
<i>Plegadis ridgwayi</i>	Puna Ibis	6	-	-	-	1	2/3
<i>Platalea alba</i>	African Spoonbill	3	-	-	-	-	0/0/3
<i>Phoenicopterus chilensis</i>	Chilean Flamingo	41	-	-	-	-	17/24
Anseriformes							
<i>Dendrocygna bicolor</i>	Fulvous Whistling Duck	1	-	-	-	-	0/0/1
<i>Dendrocygna viduata</i>	White-faced Tree Duck	5	-	-	-	2	0/0/3
<i>Branta bernicla orientalis</i>	Brent Goose	3	-	-	-	-	3
<i>Aix sponsa</i>	Carolina Duck	6	-	1	1	-	2/4
<i>Callonetta leucophrys</i>	Ringed Teal	8	-	-	-	1	5/2
<i>Anas sparsa</i>	Black Duck	2	-	-	-	2	-
<i>Anas penelope</i>	Wigeon	19	-	-	-	1	10

		1	2	3	4	5	6	7
Falconiformes								
<i>Milvus migrans</i>	Black Kite	2	-	-	-	-	-	1/1
<i>Milvus migrans migrans</i>	Black Kite	1	-	-	-	-	-	1/0
<i>Haliaeetus vocifer</i>	African Sea Eagle	2	1	-	-	1	-	1/1
<i>Torgos tracheliotus</i>	Lappet-faced Vulture	2	-	-	-	-	-	1/1
<i>Terathopius ecaudatus</i>	Bateleur Eagle	2	-	-	-	-	-	1/1
<i>Polyboroides typus</i>	Harrier Hawk	4	-	1	-	-	2	1/1/1
<i>Polybura semitorquatus</i>	African Pygmy Falcon	1	-	-	-	-	-	1/0
Galliformes								
<i>Penelope purpurascens</i>	Crested Guan	4	-	-	-	-	2	1/1
<i>Crax fasciolata</i>	Bare-faced Curassow	2	-	-	-	1	-	0/1
<i>Francolinus pondicerianus</i>	Indian Grey Francolin	1	-	-	-	-	-	1/0
<i>Tragopan satyra</i>	Satyr Tragopan	2	-	-	-	-	2	-
<i>Tragopan temminckii</i>	Temminck's Tragopan	6	-	1	1	1	3	1/1
<i>Lophophanes impeyanus</i>	Himalayan Monal (Impeyan Pheasant)	6	-	-	-	2	3	1/0
<i>Lophura diardi</i> (V)	Siamese Crested Fireback	-	4	-	-	-	-	2/2
<i>Lophura edwardsi</i> (C)	Edward's Pheasant	4	-	3	2	-	-	2/2/1
<i>Crossoptilon crossoptilon</i> (V)	White Eared Pheasant	1	-	-	-	1	-	-
<i>Catreus wallichi</i> (V)	Cheer Pheasant	3	-	-	-	-	3	-
<i>Symaticus mikado</i>	Mikado Pheasant	5	-	-	-	-	5	-
<i>Pavo cristatus</i>	Common Peafowl	2	-	2	-	-	-	1/1/2
<i>Afropavo congensis</i> (V)	Congo Peafowl	1	1	-	-	-	-	1/1
<i>Acryllium vulturinum</i>	Vulturine Guineafowl	7	-	-	-	-	5	1/1
Gruiformes								
<i>Grus japonensis</i> (V)	Red-crowned Crane	2	-	1	-	-	-	1/2
<i>Grus vipio</i> (V)	White-naped Crane	1	-	-	-	-	1	-
<i>Anthropoides virgo</i>	Demoiselle Crane	2	-	-	-	-	-	1/1
<i>Gallinula nesiotis comeri</i> (V)	Gough Island Moorhen	-	2	2	1	-	-	1/1/1
Charadriiformes								
<i>Barthicus ordicnemus</i>	Stone Curlew	2	-	4	3	-	-	1/1/1
<i>Namenius arquata</i>	Curlew	1	-	-	-	-	-	-
<i>Tringa totanus</i>	Redshank	1	-	-	-	-	1	-
<i>Larus cirrocephalus poiocephalus</i>	Grey-headed Gull	16	-	6	-	3	-	0/0/19
<i>Larosterna inca</i>	Inca Tern	4	-	-	-	-	-	1/3
<i>Uria aalge</i>	Guillemot	2	-	-	-	-	-	0/0/2
Columbiformes								
<i>Columba guinea</i>	Speckled Pigeon	26	-	3	-	9	-	0/0/20
<i>Ducula aenea aenea</i>	Green Imperial Pigeon	2	-	4	-	-	-	1/5
<i>Ducula aenea paulina</i>	Chestnut-naped Imperial Pigeon	-	3	-	-	-	-	0/0/3
<i>Ducula bicolor</i>	Pied Imperial Pigeon	1	-	-	-	-	1	-
<i>Ptilinopus cinctus albocinctus</i>	Black-backed Fruit Dove	3	-	2	-	1	-	2/1/1
<i>Ptilinopus jamba</i>	Jambu Fruit Dove	4	1	-	-	-	1	2/2
<i>Ptilinopus magnificus</i>	Magnificent Fruit Dove	4	-	-	-	1	-	2/1
<i>Ptilinopus melanospila</i>	Black-naped Fruit Dove	4	-	-	-	-	-	2/2
<i>Ptilinopus superbus</i>	Superb Fruit Dove	1	1	1	1	-	-	1/1
Psittaciformes								
<i>Charmosyna josefinae</i>	Josephine's Lorikeet	-	2	-	-	-	-	1/1
<i>Charmosyna placensis placensis</i>	Red-flanked Lorikeet	4	2	1	-	3	-	3/1
<i>Charmosyna pulchella rothschildi</i>	Fairy Lorikeet	4	-	5	2	-	1	1/1/4
<i>Charmosyna rubronotata</i>	Red-spotted Lorikeet	2	-	-	-	-	-	1/1
<i>Eos cyanoerga</i> (V)	Black-winged Lory	2	-	-	-	-	-	1/1
<i>Eos reticulata</i>	Blue-streaked Lory	4	-	-	-	-	-	3/1
<i>Cacatua alba</i> (V)	White-crested Cockatoo	2	1	-	-	-	-	1/2
<i>Cacatua goffini</i>	Goffin's Cockatoo	-	5	-	-	-	-	3/2
<i>Cacatua halmaturaypygia</i> (C)	Red-vented Cockatoo	-	2	-	-	-	-	1/1
<i>Cacatua moluccensis</i> (V)	Salmon-crested Cockatoo	3	-	2	2	-	-	2/1

		1	2	3	4	5	6	7
<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	2	-	-	-	-	-	1/1
<i>Irena puella</i>	Fairy Bluebird	2	1	-	-	1	-	1/1
<i>Garrulax leucolepis</i>	White-crested Laughing Thrush	1	-	-	-	-	1	-
<i>Garrulax chinensis</i>	Black-throated Laughing Thrush	2	2	-	-	-	-	4/0
<i>Garrulax sannio</i>	White-browed Laughing Thrush	2	-	-	-	-	-	1/1
<i>Leiothrix argentauris</i>	Silver-eared Mesia	2	-	-	-	-	-	1/1
<i>Leiothrix lutea</i>	Pekin Robin (Red-billed Leiothrix)	1	-	-	-	1	-	-
<i>Zosterops sp.</i>	White-eye	2	-	-	-	2	-	-
<i>Pavaria coronata</i>	Red-crested Cardinal	2	-	-	-	-	-	1/1
<i>Ramphocelus carbo</i>	Silver-beaked Tanager	2	-	-	-	-	-	1/1
<i>Tangara icterocephala</i>	Silver-throated Tanager	2	-	-	-	-	-	1/1
<i>Quelea quelea</i>	Red-beaked Weaver (Quelea)	2	-	-	-	-	-	1/1
<i>Foudia flavicans</i> (V)	Rodriguez Fody	4	1	-	-	-	-	2/3
<i>Lampornis iris</i>	Emerald Glossy Starling	2	-	-	-	-	-	1/1
<i>Spreo superbus</i>	Superb Glossy Starling	5	-	2	1	1	2	1/1/1
<i>Certhopora cinerea</i>	Wattled Starling	1	-	-	-	-	1	-
<i>Sturnus roseus</i>	Rose-coloured Starling	2	-	-	-	-	-	1/1
<i>Sturnus contra</i>	Asian Pied Starling	3	-	-	-	-	-	1/1/1
<i>Leucophaea rothschildi</i> (C)	Rothschild's Mynah	3	-	-	-	-	-	2/1
<i>Ampeliceps coronatus</i>	Golden-crested Mynah	2	-	1	-	-	-	2/1
<i>Gracula religiosa intermedia</i>	Nepal Hill Mynah	2	-	-	-	-	-	1/1
<i>Corvus corone</i>	Carrion Crow	-	1	-	-	-	1	-
Domestic								
	Duck	3	-	-	-	-	-	0/3
	Chicken	5	-	-	-	-	-	0/5
	Budgerigar	-	8	-	-	-	-	4/4
	Bengalese Finch	-	10	-	-	-	10	-
Total: Birds		623	92(1)	132	38	71	153(1)	585

REPTILES								
Testudines								
<i>Sternotherus odoratus</i>	Stinkpot	1	4	5	-	1	1	2/2/4
<i>Chersina angulata</i>	South African Bowsprit Tortoise	-	1	-	-	1	-	-
<i>Kinosternon subrubrum</i>	Eastern Mud Terrapin	1	-	-	-	-	-	0/0/1
<i>Kinosternon scorpioides</i>	Scorpion Mud Terrapin	2	-	-	-	-	-	1/1
<i>Trachemys scripta dorbignyi</i>	South American Ornate Terrapin	1	-	-	-	-	-	0/1
<i>Trachemys scripta elegans</i>	Red-eared Terrapin	6	-	-	-	-	-	3/3
<i>Terrapene carolina triunguis</i>	Three-toed Box Terrapin	1	-	-	-	-	-	1/0
<i>Homopus arolatus</i>	Parrot-beaked Cape Tortoise	-	3	-	-	-	-	1/1/1
<i>Testudo graeca</i>	Spur-thighed Tortoise	10	-	-	-	1	-	3/6
<i>Testudo hermanni</i> (V)	Hermann's Tortoise	1	-	-	-	-	-	1/0
<i>Testudo horsfieldi</i>	Horsfield's Tortoise	-	86	-	-	4	46(10)	11/12/13
<i>Testudo kleinmanni</i> (V)	Egyptian Tortoise	2	9	-	-	1	3	1/2/4
<i>Malacochersus tornieri</i> (K)	Pancake Tortoise	1	1	-	-	-	-	1/1
<i>Geochelone denticulata</i>	Yellow-footed Tortoise	-	1	-	-	-	-	1/0
<i>Geochelone sulcata</i>	African Spurred Tortoise	-	1	-	-	-	-	0/0/1
<i>Eretmochelys imbricata</i> (E)	Hawksbill Turtle	3	-	-	-	-	-	2/1
<i>Chelus fimbriatus</i>	Matamora	5	-	-	-	-	-	0/0/5
<i>Chelodina longicollis</i>	Long-necked Terrapin	5	-	-	-	-	-	2/3
<i>Trionyx hurum</i>	Peacock Soft-shelled Turtle	2	-	-	-	-	-	1/1
Crocodylia								
<i>Crocodylus niloticus</i>	Nile Crocodile	2	-	-	-	-	-	1/1
<i>Alligator sinensis</i> (E)	Chinese Alligator	5	-	-	-	-	-	1/2/2

		1	2	3	4	5	6	7
<i>Cacatua tenuirostris pascinator</i>	Western Slender-billed Cockatoo	2	-	-	-	-	2	-
<i>Nestor notabilis</i>	Kea	1	2	-	-	-	1	1/1
<i>Polytelus alexandriae</i> (V)	Princess of Wales' Parrakeet	2	-	-	-	1	-	0/1
<i>Poicephalus robustus</i>	Cape Parrot	2	-	-	-	-	-	1/1
<i>Agapornis nigrigenis</i> (E)	Black-cheeked Lovebird	-	6	-	-	2	-	2/2
<i>Anodorhynchus hyacinthinus</i> (V)	Hyacinth Macaw	5	1	-	-	-	-	4/2
<i>Ara ararauna</i>	Blue-&-yellow Macaw	2	3	-	-	-	-	3/2
<i>Ara militaris</i> (V)	Military Macaw	-	2	-	-	-	-	1/1
<i>Aratinga solstitialis</i>	Sun Conure	3	-	-	-	-	-	1/0/2
<i>Enicognathus ferrugineus</i>	Austral Conure	2	-	-	-	-	-	1/1
<i>Enicognathus leptorhynchus</i>	Slender-billed Conure	5	-	3	1	1	-	1/0/5
<i>Loriculus galgulus</i>	Blue-crowned Hanging Parrot	2	-	-	-	-	-	0/2
<i>Myiopsitta monachus</i>	Quaker (Monk) Parrakeet	21	-	6	-	7	-	0/1/19
Cuculiformes								
<i>Muscophaga violacea</i>	Violet Plantain-eater	1	2	-	-	1	1	0/1
<i>Tauraco persa livingstonii</i>	Livingstone's Turaco	5	1	3	-	1	2	3/3
<i>Tauraco erythrorhynchus</i>	Red-crested Turaco	2	-	-	-	-	-	1/1
<i>Tauraco hartlaubii</i>	Hartlaub's Turaco	2	2	-	-	1	1	0/2
<i>Tauraco leucotis</i>	White-cheeked Turaco	7	-	1	-	-	-	3/2/3
Strigiformes								
<i>Tyto alba</i>	Barn Owl	2	-	-	-	-	-	2/0
<i>Otus bakkamoena</i>	Collared Scops Owl	2	2	-	-	-	-	2/2
<i>Otus leucotis</i>	White-faced Scops Owl	16	5	7	-	1	14(1)	7/6
<i>Bubo bubo</i>	Eurasian Eagle Owl	1	-	-	-	-	-	1/0
<i>Bubo ussuleri</i> (V)	Nduk Eagle Owl	1	-	-	-	-	-	1/0
<i>Pulsatrix perspicillata</i>	Spectacled Owl	2	-	2	1	-	1	1/1
<i>Nyctea scandiaca</i>	Snowy Owl	1	-	-	-	-	1	-
<i>Ninox novaezelandiae</i>	Boobook Owl	3	1	2	-	-	4	1/1
<i>Athene brama</i>	Spotted Owlet	1	-	-	-	-	1	-
<i>Speotyto cunicularia</i>	Burrowing Owl	3	-	8	-	4	5	1/1
<i>Strix hylophila</i>	Rusty Barred Owl	1	1	-	-	-	-	1/1
<i>Strix uralensis</i>	Ural Owl	3	1(1)	-	-	-	-	2/2
<i>Strix nebulosa</i>	Great Grey Owl	2	-	-	-	-	-	1/1
Trogoniformes								
<i>Pharomachus auriceps</i>	Golden-headed Quetzal	1	-	-	-	-	-	0/1
Coraciiformes								
<i>Dacelo novaezelandiae</i>	Kookaburra	3	-	-	-	-	-	1/1/1
<i>Coracias caudata</i>	Lilac-breasted Roller	2	-	6	-	-	3	1/1/3
<i>Tockus erythrorhynchus</i>	Red-billed Hornbill	2	-	-	-	-	-	1/1
<i>Penelopides panini</i> (C)	Tarctic Hornbill	1	1	-	-	-	-	1/1
<i>Antheroceros cornatus</i>	Southern Pied Hornbill	3	-	-	-	-	-	1/2
<i>Bycanistes subcylindricus</i>	Black-&-white Casqued Hornbill	2	-	-	-	-	-	1/1
<i>Buceros bicornis</i>	Great Indian Hornbill	1	1	-	-	-	1	0/1
<i>Buceros hydrocorax</i>	Rufous Hornbill	2	-	-	-	2	-	-
Piciformes								
<i>Psilopogon pyrolophus</i>	Fire-tufted Barbet	1	-	-	-	-	-	1/0
<i>Lybius dubius</i>	Bearded Barbet	1	1	-	-	-	-	1/1
<i>Pteroglossus aracari</i>	Black-necked Aracari	5	-	-	-	-	-	4/1
<i>Pteroglossus castanotis</i>	Chestnut-eared Aracari	1	-	-	-	-	-	0/1
<i>Basilornis balfiori</i>	Saffron Toucanet	2	-	-	-	-	-	1/1
<i>D</i>								

		1	2	3	4	5	6	7
<i>Lampropeltis triangulum sinaloa</i>	Sinaloa Milk Snake	5	-	7	-	1	-	2/2/7
<i>Lampropeltis triangulum hondurensis</i>	Honduran Milk Snake	-	2	-	-	-	-	0/2
<i>Lampropeltis aurora</i>	Aurora House Snake	-	1	-	-	-	-	0/0/1
<i>Lampropeltis inornatus</i>	Olive House Snake	-	7	-	-	-	4	0/0/3
<i>Lampropeltis fuliginosus</i>	African House Snake	2	-	-	-	-	-	0/0/2
<i>Pseudaspis subaenariata</i>	Peter's Long-lined Snake	1	-	-	-	-	-	1/0
<i>Pseudaspis cana</i>	Mole Snake	1	-	-	-	-	-	0/0/1
<i>Oxyuratus scutellatus</i>	Taipan	5	-	-	-	1	-	3/1
<i>Notechis scutatus</i>	Tiger Snake	2	-	-	-	-	-	1/1
<i>Naja pallida</i>	Red Spitting Cobra	2	2	-	-	-	-	3/1
<i>Naja kaouthia</i>	Monocellate Cobra	1	1	-	-	-	-	1/1
<i>Dendroaspis angusticeps</i>	Common Green Mamba	2	-	-	-	-	-	1/1
<i>Vipera berus</i>	Adder	1	-	-	-	-	-	0/1
<i>Vipera ammodytes ammodytes</i>	Western Long-nosed Viper	2	-	-	-	-	-	1/1
<i>Vipera raddai</i>	Armenian Viper	-	2	-	-	-	-	0/2
<i>Vipera russelli</i>	Russell's Viper	1	-	-	-	1	-	-
<i>Bitis arietans</i>	Puff Adder	2	-	-	-	-	-	1/1
<i>Bitis gabonica rhinoceros</i>	Gaboon Viper	1	1	-	-	1	-	1/0
<i>Echis carinatus sochureki</i>	Saw-scaled Viper	5	-	20	-	-	-	1/1/23
<i>Echis carinatus ocellatus</i>	West African Saw-scaled Viper	2	-	-	-	-	-	1/1
<i>Echis carinatus leakeyi</i>	East African Saw-scaled Viper	3	-	-	-	-	-	1/2
<i>Agkistrodon contortrix contortrix</i>	Southern Copperhead	3	-	-	-	-	-	1/2
<i>Agkistrodon piscivorus</i>	Cottonmouth Moccasin	1	-	-	-	-	-	1/0
<i>Calliselas rhodostoma</i>	Malayan Pit Viper	21	-	5	1	3	-	1/2/19
<i>Trimeresurus purpuromaculatus</i>	Mangrove Pit Viper	1	-	-	-	-	-	1/0
<i>Bothrops atrox</i>	Fer-de-Lance	1	1	-	-	-	-	0/2
<i>Bothrops mojoneni</i>	Mojon's Fer-de-Lance	1	-	-	-	-	-	1/0
<i>Crotalus durissus culminatus</i>	North Western Neotropical Rattlesnake	1	-	-	-	-	-	1/0
<i>Crotalus scutulatus</i>	Mojave Rattlesnake	2	-	-	-	-	-	1/1
<i>Crotalus viridis helleri</i>	South Pacific Rattlesnake	2	-	-	-	-	-	1/1
<i>Crotalus mitchelli</i>	Speckled Rattlesnake	1	-	-	-	-	-	1/0
<i>Crotalus cerastes</i>	Sidewinder	1	-	-	-	-	-	0/0/1
Total: Reptiles		243	185	79	3	36	121(10)	347

AMPHIBIANS

		1	2	3	4	5	6	7
Caudata								
<i>Ambystoma mexicanum</i> (R)	Axolotl	5	-	-	-	-	5	-
<i>Pleurodeles waltl</i>	Spanish Ribbed Newt	7	-	-	-	1	6	-
<i>Salamandra salamandra</i>	Fire Salamander	12	-	-	-	-	12	-
<i>Taricha torosa</i>	Rough-skinned Newt	2	-	-	-	1	1	-
<i>Triturus vulgaris</i>	Smooth Newt	3	-	-	-	-	3	-
<i>Pachytriton</i> sp.	Dog-faced Newt	10	-	-	-	1	9	-
Anura								
<i>Agalychnis callidryas</i>	Red-eyed Tree Frog	-	4	-	-	-	1	0/0/3
<i>Bombina orientalis</i>	Oriental Fire-bellied Toad	19	-	-	-	2	17	-
<i>Bufo rubropunctatus</i>	Red-spotted Toad	6	-	-	-	-	6	-
<i>Bufo viridis</i>	Green Toad	10	-	-	-	-	10	-
<i>Colostethus trinitatus</i>	Stream Frog	45	-	50	20	73	-	1/1
<i>Dendrobates auratus</i>	Green & Black Poison Frog	-	3	-	-	-	-	1/2
<i>Dendrobates tinctorius</i>	Blue & Yellow Poison Frog	-	4	13	-	2	7	1/1/6
<i>Dyscophus antongilii</i>	Tomato Frog	-	4	-	-	1	-	0/0/3
<i>Hymenochirus</i> sp.	Dwarf Surinam Toad	7	-	-	-	-	-	0/0/7

		1	2	3	4	5	6	7
Atheriniformes								
<i>Bodotia gonyi</i> (K)	Madagascar Rainbow	-	-	1	-	0/nr	0/0/5	1/M
<i>Glossogobius aureus</i>	Metallic Rainbow	-	-	-	-	0/nr	0/0/2	1/M
<i>Melanotaenia boesemani</i> (V)	Boeseman's Rainbowfish	-	-	2	-	0/nr	0/0/7	1/M
<i>Melanotaenia splendida</i>	Crimson-spotted Rainbow	-	-	1	-	0/nr	0/0/1	1/M
<i>Melanotaenia trifasciatus</i>	Rainbowfish	-	-	2	-	0/nr	0/0/4	1/M
Beryciformes								
<i>Myripristis jacobus</i>	Blackbar Soldierfish	15	-	14	-	0/nr	0/0/1	1/M
<i>Sargocentron coruscus</i>	Reef Squirrelfish	2	-	2	-	0/nr	0/0/0	1/na
Ceratodiformes								
<i>Neoceratodus forsteri</i>	Australian Lungfish	-	-	-	-	0/nr	0/0/1	1/M
Characiformes								
<i>Leporinus fasciatus</i>	Black-banded Leporinus	-	-	-	-	0/nr	0/0/1	1/M
<i>Alestes longipinnis</i>	African Long-finned Tetra	-	-	-	3	0/nr	0/0/0	1/na
<i>Astyanax mexicanus</i>	Blind Cavefish	10	-	4	-	0/nr	0/0/6	1/M
<i>Hemigrammus bleheri</i>	Rummy-nose Tetra	12	-	-	-	0/nr	0/0/12	1/M
<i>Hemigrammus caudovittatus</i>	Buenos Aires Tetra	-	-	1	41	0/nr	0/0/0	A/na
<i>Hyphessobrycon herbertaxelrodi</i>	Black Neon Tetra	20	-	2	-	0/nr	0/0/38	A/M
<i>Hyphessobrycon pulchripinnis</i>	Lemon Tetra	20	-	-	-	0/nr	0/0/20	A/M
<i>Hyphessobrycon rubrostrigatus</i>	Bleeding Heart Tetra	-	-	1	5	0/nr	0/0/0	1/na
<i>Hyphessobrycon serpaie</i>	Serpae Tetra	20	-	2	-	0/nr	0/0/30	A/M
<i>Metynnis argenteus</i>	Silver Dollar	-	-	1	-	0/nr	0/0/9	A/M
<i>Micralestes interruptus</i>	Congo Tetra	-	-	4	1	0/nr	0/0/0	1/na
<i>Myxus rubripinnis</i>	Red Hook Pacu	-	-	-	-	0/nr	0/0/8	1/M
<i>Paracheirodon axelrodi</i>	Cardinal Tetra	-	-	-	-	0/nr	0/0/10	A/M
<i>Pristella riddlei</i>	X-Ray Tetra	-	-	11	10	0/nr	0/0/0	A/na
<i>Serrasalmo mattereri</i>	Red-bellied Piranha	-	-	22	-	0/nr	0/0/135	A/D
<i>Triplophys angulatus</i>	Narrow Hatchetfish	-	-	-	-	0/nr	0/0/8	1/M
Cypriniformes								
<i>Myxocyprinus asiaticus</i>	Chinese Sailfin Sucker	4	-	-	-	4/0	0/0/0	1/M
<i>Acanthopoma myersi</i>	Slimy Coolie Loach	-	-	-	12	0/nr	0/0/1	A/M
<i>Botia hymenophysa</i>	Tiger Botia	-	-	-	-	0/nr	0/0/5	1/M
<i>Botia lohachata</i>	Pakistani Loach	-	-	-	-	0/nr	0/0/4	1/M
<i>Botia macracantha</i>	Clown Loach	-	-	-	-	0/nr	0/0/9	1/M
<i>Botia modesta</i>	Red-finned Botia	-	-	-	-	0/nr	0/0/5	1/M
<i>Botia sidthimunki</i>	Chain Loach	-	-	-	-	0/nr	0/0/12	A/M
<i>Botia striata</i>	Striped Loach	-	-	-	-	0/nr	0/0/4	1/M
<i>Lepidocephalichthys thermalis</i>	Spotted Loach	-	-	-	-	0/nr	0/0/13	A/M
<i>Leptobotia manschurica</i>	Manchurian Loach	5	-	-	-	0/nr	0/0/5	1/M
<i>Misgurnus fossilis</i>	Weatherloach	-	-	1	-	0/nr	0/0/0	1/na
<i>Achelognathus micropterus</i>	Asian Bitterling	-	-	4	-	0/nr	0/0/8	1/M
<i>Barbodes schwanenfeldi</i>	Tinsel Barb	-	-	-	-	0/nr	0/0/3	1/M
<i>Barbus barbus</i>	Barbel	-	-	-	-	1/nr	0/0/4	1/M
<i>Barbus semifasciatus</i>	Chinese Green Barb	-	-	1	-	0/nr	0/0/7	1/M
<i>Barbus "odessa"</i>	Odessa Barb	-	-	7	-	0/nr	0/0/0	1/na
<i>Carassius auratus</i>	Goldfish	-	-	-	-	0/nr	0/0/20	A/M
<i>Ctenopharyngodon idella</i>	Grass Carp	-	-	-	-	0/nr	0/0/6	1/M
<i>Cyprinus carpio</i>	Carp - Koi, mirror, etc.	-	-	3	54	0/nr	0/0/60	A/M
<i>Epilabrychthys siamensis</i>	Flying Fox	-	-	-	-	0/nr	0/0/6	1/M
<i>Garra</i> sp.	Chinese Loach	5	-	1	-	0/nr	0/0/4	1/M
<i>Gobio gobio</i>	Gudgeon	3	-	2	-	0/nr	0/0/7	1/M
<i>Hypophthalmichthys molitrix</i>	Silver Carp	-	-	-	-	0/nr	0/0/8	1/M
<i>Labeo bicolor</i>	Red-tailed Black Shark	-	-	-	1	0/nr	0/0/0	1/na
<i>Leuciscus cephalus</i>	Chub	-	-	1	-	0/nr	0/0/3	1/M
<i>Leuciscus idus</i>	Ide or Orfe	-	-	2	-	0/nr	0/0/6	1/M
<i>Noemacheilus barbatus</i>	Stone Loach	3	-	-	-	0/nr	0/0/5	1/M
<i>Notropis lutrensis</i>	Red Shiner	-	-	40	-	0/nr	0/0/0	A/na

		1	2	3	4	5	6	7
<i>Pipa pipa</i>	Surinam Toad	2	-	-	-	-	-	0/0/2
<i>Mantella pulchra</i>	Mantella	10	-	-	-	1	9	-
<i>Rana catesbeiana</i>	American Bullfrog	2	1	-	-	-	-	0/0/3
<i>Rana pipiens</i>	Leopard Frog	1	-	-	-	1	-	-
<i>Rana ridibunda</i>	Marsh Frog	2	-	-	-	-	2	-
<i>Rana temporaria</i>	Common Frog	1	-	-	-	-	1	-
<i>Xenopus tropicalis</i>	Clawed Frog	3	-	-	-	-	-	0/0/3
Total: Amphibians		147	16	63	20	83	89	34

Key to columns for Fishes and Invertebrates:

- column 1 Arrivals
- column 2 Births/Hatchings
- column 3 Deaths
- column 4 Departures
- column 5 Number at end of year of Young/Eggs
- column 6 Number at end of year of Adult Male/Adult Female/Adult Unknown or No Gender
- column 7 Count Unit: I=Adult numbers represent exact number of individuals. Young and Eggs may be estimated. A=All numbers are approximate. C=Numbers represent exact number of colonies
- column 8 Population Status: M=Maintaining, B=Breeding, D=Declining, N=Newly acquired species. nr=Not recorded. na=Not applicable.

IUCN threatened species categories

- C=Critically endangered. E=Endangered. Ex=Extinct in situ. I=Indeterminate. K=Insufficiently known. R=Rare. V=Vulnerable.

FISHES		1	2	3	4	5	6	7/8
Chondrichthyes								
Lamiformes								
<i>Carcharhinus melanopterus</i>	Black-tipped Reef Shark	-	-	1	-	0/na	3/0/0	1/M
<i>Triakis semifasciata</i>	Leopard Shark	-	-	-	-	1/nr	0/1/0	1/M
<i>Scyliorhinus canicula</i>	Spotted Dogfish	3	-	-	-	0/nr	4/3/0	1/M
Rajiformes								
<i>Potomotrygon</i> sp.	Freshwater Stingray	-	-	-	-	0/na	2/1/0	1/M
<i>Raja clavata</i>	Thorback Ray	-	2	8	-	2/nr	0/0/3	1/B
<i>Raja microcellata</i>	Small-eyed Ray	-	-	-	-	0/nr	1/2/0	1/M
<i>Raja montagui</i>	Spotted Ray	-	-	1	-	0/nr	0/0/0	1/na
Osteichthyes								
Acipenseriformes								
<i>Acipenser ruthenus</i>	Sterlet	-	-	-	-	2/nr	0/0/6	1/M
<i>Scaphirhynchus platyrhynchus</i>	Shovelnose Sturgeon	-	-	-	-	0/nr	0/0/2	1/M
<i>Polyodon spathula</i> (V)	Paddlefish	10	-	-	-	10/nr	0/0/1	A/M
Amiiformes								
<i>Amia calva</i>	Bowfin	-	-	-	-	0/nr	0/0/4	1/M
Anguilliformes								
<i>Anguilla anguilla</i>	Common Eel	-	-	1	-	0/nr	0/0/2	1/M
<i>Conger conger</i>	Conger Eel	6	-	1	-	6/nr	0/0/0	1/M
<i>Echidna catenata</i>	Leopard Moray Eel	2	-	2	-	0/nr	0/0/0	1/na
<i>Echidna nebulosa</i>	Snowflake Moray Eel	1	-	1	-	0/nr	0/0/0	1/na
<i>Echidna zebra</i>	Zebra Moray Eel	2	-	-	-	0/nr	0/0/2	1/M
<i>Gymnothorax</i> sp.	Moray Eel	1	-	1	-			

		1	2	3	4	5	6	7/8
<i>Apogon maculatus</i>	Flamefish	20	-	20	-	0/nr	0/0/0	1/na
<i>Apogon nemosipinnatus</i>	Pyjama Cardinal	20	-	17	-	0/nr	0/0/4	1/M
<i>Apogon quadrisquamatus</i>	Sawcheek Cardinalfish	4	-	4	-	0/nr	0/0/0	1/na
<i>Belontiia signata</i> (R)	Combtail	-	-	9	-	0/nr	0/0/24	A/M
<i>Betta splendens</i>	Siamese Fighting Fish	-	10	2	-	10/nr	0/0/0	1/M
<i>Macropodus opercularis</i>	Paradise Fish	-	15	3	15	0/nr	0/0/3	1/M
<i>Trichogaster leeri</i>	Pearl Gourami	-	-	3	-	0/nr	0/0/0	1/na
<i>Trichogaster pectoralis</i>	Snake Skin Gourami	-	-	-	-	0/nr	0/0/3	1/M
<i>Trichogaster trichogaster</i>	Three-spot Gourami	-	-	2	2	0/nr	0/0/2	1/M
<i>Blennius gattorugine</i>	Tompot Blenny	-	-	13	-	0/nr	0/0/18	A/D
<i>Blennius pholis</i>	Shanny or Common Blenny	-	-	4	-	0/nr	0/0/2	1/M
<i>Synchiropus picturatus</i>	Psychedelic Mandarin	-	-	1	-	0/nr	0/0/0	1/na
<i>Synchiropus splendidus</i>	Mandarin Fish	2	-	1	-	0/nr	0/0/1	1/M
<i>Lepomis gibbosus</i>	Pumpkinseed	-	-	-	-	0/nr	0/0/8	1/M
<i>Lepomis gulosus</i>	Warmouth Bass	-	-	-	-	0/nr	0/0/4	1/M
<i>Lepomis humilis</i>	Orange Spotted Sunfish	10	-	-	-	0/nr	0/0/10	A/M
<i>Lepomis macrochirus</i>	Bluegill Sunfish	-	-	1	-	0/nr	0/0/5	1/M
<i>Lepomis megalotis</i>	Long-eared Sunfish	-	-	-	-	0/nr	0/0/8	1/M
<i>Chromidotilapia guentheri</i>	Guenther's Mouthbrooder	-	-	2	-	0/nr	0/0/6	1/M
<i>Cichlasoma nigrofasciatum</i>	Convict Cichlid	-	-	-	-	0/nr	0/0/2	1/M
<i>Haplochromis ishmaeli</i> (I)	Lake Victoria Cichlid	-	6	10	-	10/nr	0/0/30	A/M
<i>Jalidochromis marlieri</i>	Julie Cichlid	-	-	-	-	0/nr	0/0/1	1/M
<i>Jalidochromis ornatus</i>	Ornate Julie	-	-	-	-	0/nr	0/0/4	1/M
<i>Jalidochromis regani</i>	Striped Julie	-	-	-	-	0/nr	0/0/7	1/M
<i>Labotropheus fuelleborni</i>	Red-top Cichlid	-	-	2	-	0/nr	0/0/8	A/M
<i>Melanochromis auratus</i>	Golden Cichlid	-	-	-	-	0/nr	0/0/10	A/M
<i>Melanochromis chipoke</i>	Chipokee Mbuna	-	-	-	-	0/nr	0/0/1	1/M
<i>Melanochromis johanni</i>	Johanni Mbuna	-	-	-	-	0/nr	0/0/9	1/M
<i>Melanochromis sp.</i>	Mbuna	-	-	-	-	0/nr	0/0/5	1/M
<i>Nannacara anomala</i>	Dwarf Cichlid	-	-	1	-	0/nr	0/0/3	1/M
<i>Neolamprologus brichardi</i>	Lyretail Lamprologus	-	18	6	-	18/nr	0/0/22	A/B
<i>Neolamprologus leleupi</i>	Golden Lamprologus	-	-	3	-	0/nr	0/0/6	1/M
<i>Pseudotropheus aureus</i>	Aurora Cichlid	-	-	5	-	0/nr	0/0/2	1/M
<i>Pseudotropheus elongatus</i>	Slender Mbuna	-	-	-	-	0/nr	0/0/1	1/M
<i>Pseudotropheus livingstonii</i>	Livingstone's Mbuna	-	-	-	-	0/nr	0/0/6	1/M
<i>Pseudotropheus lombardoi</i>	Kennyi Mbuna	-	-	-	-	0/nr	0/0/4	1/M
<i>Pseudotropheus tropheops</i>	Tropheops Mbuna	-	-	-	-	11/nr	0/0/40	A/B
<i>Pseudotropheus zebra</i>	Zebra Mbuna	-	10	6	-	17/nr	0/0/24	A/M
<i>Pterophyllum scalare</i>	Angel Fish	-	-	3	-	0/nr	0/0/26	A/M
<i>Symphysodon aequifasciata</i>	Green Discus	-	-	2	-	0/nr	0/0/1	1/M
<i>Tetramodon vittatus</i>	Tanganyikan Goby Cichlid	-	-	-	-	0/nr	0/0/6	1/M
<i>Neocirrhites armatus</i>	Scarlet Hawkfish	-	-	-	-	0/nr	0/0/1	1/M
<i>Oxyrrhites typus</i>	Long-nosed Hawkfish	-	-	1	-	0/nr	0/0/0	1/na
<i>Periophthalmus sp.</i>	Mudskipper	-	-	-	-	0/nr	0/0/3	1/M
<i>Ptereleotris eoides</i>	Torpedo Goby	-	-	1	-	0/nr	0/0/1	1/M
<i>Labroides dimidiatus</i>	Cleaner Wrasse	6	-	5	-	0/nr	0/0/4	1/M
<i>Labrus bergylla</i>	Ballen Wrasse	-	-	2	-	0/nr	0/0/7	1/M
<i>Labrus viridis</i>	Green Wrasse	1	-	-	-	0/nr	0/0/1	1/M
<i>Symphodus melops</i>	Corkwing Wrasse	15	-	-	-	2/0	0/0/13	1/M
<i>Datnioides quadricinctus</i>	Many-barred Tiger Fish	-	-	-	-	0/nr	0/0/3	1/M
<i>Monodactylus argenteus</i>	Silver Fish	-	-	2	-	0/nr	0/0/5	1/M
<i>Mugil labrosus</i>	Thick-lipped Grey Mullet	-	-	-	-	0/nr	0/0/39	A/M
<i>Dicentrarchus labrax</i>	Sea Bass	-	-	3	-	0/nr	0/0/23	A/M
<i>Siniperca chuatsi</i>	Chinese Perch	-	-	-	-	0/nr	0/0/3	1/M
<i>Etheostoma caeruleum</i>	Rainbow Darter	-	-	4	-	0/nr	0/0/1	1/M
<i>Etheostoma sp.</i>	Darter	-	-	2	-	0/nr	0/0/0	1/na
<i>Gymnocephalus cernuus</i>	Ruffe	2	-	-	-	2/nr	0/0/0	1/M
<i>Perca fluviatilis</i>	Perch	-	-	-	-	1/nr	0/0/9	A/M
<i>Centropyge acanthops</i>	Cherub Angel	-	-	1	-	0/nr	0/0/1	1/M
<i>Centropyge loriculus</i>	Flame Angel	-	-	1	-	0/nr	0/0/0	1/na

		1	2	3	4	5	6	7/8
<i>Synodontis clarias</i>	Red-tailed Synodontis	-	-	-	-	0/nr	0/0/1	1/M
<i>Synodontis multipunctatus</i>	Spotted Synodontis	-	-	-	-	0/nr	0/0/4	1/M
<i>Synodontis sp.</i>	Synodontis	-	-	-	-	0/nr	0/0/4	1/M
<i>Kryptopterus bicirrhus</i>	Glass Catfish	-	-	7	1	0/nr	0/0/0	1/na
<i>Silurus glanis</i>	Wels Catfish	-	-	-	-	0/nr	0/0/3	1/M
Syngnathiformes								
<i>Hippocampus erectus</i>	Lined Seahorse	-	-	1	-	0/nr	0/0/0	1/na
<i>Hippocampus histrix</i>	Prickly Seahorse	-	-	2	-	0/nr	1/5/0	1/M
<i>Nerophis ophidian</i>	Worm Pipefish	-	-	6	-	0/nr	0/0/4	1/M
<i>Syngnathus acus</i>	Great Pipefish	-	-	1	-	0/nr	0/0/0	1/na
<i>Hippocampus sp.</i>	Seahorse	8	-	8	-	0/nr	0/0/0	1/na
Tetradontiformes								
<i>Balistes carolinensis</i>	Grey Triggerfish	1	-	1	-	0/nr	0/0/1	1/M
<i>Balistoides conspicillum</i>	Clown Triggerfish	1	-	1	-	0/nr	0/0/0	1/na
<i>Odontaspis niger</i>	Black Triggerfish	1	-	-	-	1/nr	0/0/0	1/na
<i>Arothron hispidus</i>	Striped-belly Puffer	2	-	-	-	0/nr	0/0/2	1/M
<i>Arothron reticularis</i>	Reticulated Puffer	1	-	1	-	0/nr	0/0/0	1/na
<i>Arothron stellatus</i>	Spotted Puffer	1	-	-	-	0/nr	0/0/1	1/M
Pteraspidomorphi								
Petromyzontiformes								
<i>Lampetra planeri</i>	Brook Lamprey	1	-	1	-	0/nr	0/0/0	1/na
Total: Fishes: 194 species; approx. 2280 specimens								

INVERTEBRATES

(Invertebrates in the aquarium are not listed)

Cnidaria								
Scyphozoa								
<i>Aurelia aurita</i>	Moon Jellyfish	-	nr	200	-	0/nr	0/0/0	A/na
Annelida								
Hirudinea								
<i>Hirudo sp.</i>	American Medicinal Leech	12	-	6	-	4/0	0/0/2	A/D
<i>Hirudo medicinalis</i> (I)	Medicinal Leech	-	-	5	-	0/0	0/0/5	1/D
Mollusca								
Gastropoda								
<i>Partula arguta</i> (E)	Polynesian Tree Snail	9	7	9	0	4/0	0/0/3	1/D
<i>Partula dentifera</i> (E)	Polynesian Tree Snail	0	131	88	0	53/0	0/0/26	1/B
<i>Partula feba</i> (E)	Polynesian Tree Snail	0	309	285	0	108/0	0/0/114	1/M
<i>Partula hebe</i> (E)	Polynesian Tree Snail	0	190	140	0	62/0	0/0/68	1/B
<i>Partula garretti</i> (E)	Polynesian Tree Snail	0	41	42	0	2/0	0/0/9	1/M
<i>Partula labrusca</i> (E)	Polynesian Tree Snail	0	47	37	0	25/0	0/0/10	1/B
<i>Partula mirabilis x taeniata</i>	Polynesian Tree Snail	0	41	19	63	0/0	0/0/1	1/na
<i>Partula mooreana</i> (Ex)	Polynesian Tree Snail	0	138	120	0	43/0	0/0/39	1/B
<i>Partula roses</i> (Ex)	Polynesian Tree Snail	0	20	16	0	7/0	0/0/6	1/M
<i>Partula nodosa</i> (Ex)	Polynesian Tree Snail	0	454	636	100	18/0	0/0/72	1/D
<i>Partula otahitana</i> (Ex)	Polynesian Tree Snail	6	10	1	0	10/0	0/0/5	1/B
<i>Partula suturalis strigosa</i> (Ex)	Polynesian Tree Snail	70	465	454	92	121/0	0/0/66	1/B
<i>Partula suturalis vexillum</i> (Ex)	Polynesian Tree Snail	85	527	665	103	106/0	0/0/94	1/D
<i>Partula suturalis mixed ssp.</i>	Polynesian Tree Snail	0	19	38	97	0/0	0/0/0	1/na
<i>Partula taeniata elongata</i> (Ex)	Polynesian Tree Snail	330	71	222	120	28/0	0/0/71	1/D
<i>Partula taeniata nucleata</i> (Ex)	Polynesian Tree Snail	0	1	3	0	0/0	0/0/0	1/na

		1	2	3	4	5	6	7/8
<i>Pomacentrus paru</i>	French Angel	-	-	-	-	0/nr	0/0/1	1/M
<i>Aniphrion ocellaris</i>	Clownfish	3	-	-	-	0/0	0/0/4	1/M
<i>Chromis viridis</i>	Blue-green Chromis	21	-	9	-	0/0	0/0/12	A/M
<i>Dascyllus aruanus</i>	White-tailed Humbug	-	-	-	-	0/nr	0/0/1	1/M
<i>Dascyllus melanurus</i>	Black-tailed Humbug	-	-	2	-	0/nr	0/0/0	1/na
<i>Selenotoca multifasciata</i>	Green Scat	-	-	-	-	0/nr	0/0/1	1/M
<i>Anthias squamipinnis</i>	Lyretail Coralfish	21	-	15	-	0/nr	0/0/6	1/M
<i>Cephalopholis argus</i>	Peacock-eyed Grouper	-	-	-	-	0/nr	0/0/1	1/M
<i>Cephalopholis minckleyi</i>	Red Grouper	-	-	-	-	0/nr	0/0/1	1/M
<i>Cromileptes altivelis</i>	Pantherfish or Polka-dot Grouper	-	-	1	-	0/nr	0/0/2	1/M
<i>Sparus auratus</i>	Gilthead Bream	-	-	1	-	0/nr	0/0/29	A/M
<i>Toxotes jaculator</i>	Archerfish	-	-	1	-	0/nr	0/0/4	1/M
<i>Echiichthys vipera</i>	Lesser Weaver	1	-	1	-	0/nr	0/0/0	1/na
Pleuronectiformes								
<i>Psetta maxima</i>	Turbot	-	-	2	-	0/nr	0/0/2	1/M
<i>Scophthalmus rhombus</i>	Brill	-	-	1	-	0/nr	0/0/1	1/M
<i>Pleuronectes platessa</i>	Plaice	-	-	1	-	0/nr	0/0/4	1/M
Polypteriformes								
<i>Polypterus bichir</i>	Polypterus	-	-	-	-	0/nr	0/0/2	1/M
<i>Polypterus delhezi</i>	Polypterus	-	-	-	-	0/nr	0/0/1	1/M
<i>Polypterus palmatus</i>	Polypterus	-	-	-	-	0/nr	0/0/1	1/M
<i>Polypterus retropinnis</i>	Polypterus	-	-	-	-	0/nr	0/0/3	1/M
<i>Polypterus senegalus</i>	Polypterus	-	-	-	-	0/nr	0/0/1	1/M
<i>Polypterus weeksi</i>	Polypterus	-	-	-	-	0/nr	0/0/1	1/M
Salmoniformes								
<i>Salmo trutta</i>	Pike	-	-	1	-	0/nr	0/0/1	1/M
<i>Oncorhynchus mykiss</i>	Rainbow Trout	24	-	2	-	20/nr	0/0/22	A/M
Scorpaeniformes								
<i>Cottus gobio</i>	Millers Thumb	8	-	3	-	0/nr	0/0/5	1/M
<i>Myoxocephalus scorpius</i>	Father Lasher	-	-	1	-	0/nr	0/0/0	1/na
<i>Pterois volitans</i>	Dragonfish	-	-	2	-	0/nr	0/0/0	1/na
Siluriformes								
<i>Banostomus coracoides</i>	Banjo Catfish	-	-	-	-	0/nr	0/0/1	1/M
<i>Pelteobagrus brachius</i>	Amur Dragon Catfish	-	-	-	-	0/nr	0/0/12	A/M
<i>Corydoras aeneus</i>	Bronze Catfish	-	-	-	3	0/nr	0/0/2	1/M
<i>Corydoras elegans</i>	Elegant Corydoras	-	-	-	-	0/nr	0/0/5	1/M
<i>Corydoras haraldschultzei</i>	Corydoras	-	-	-	-	0/nr	0/0/4	1/M
<i>Corydoras melanostomus</i>	Black Dorsal Catfish	-	-	-	-	0/nr	0/0/2	1/M
<i>Corydoras nattereri</i>	Blue Catfish	-	-	-	-	0/nr	0/0/6	1/M
<i>Corydoras paleatus</i>	Peppered Catfish	-	-	-	1	0/nr	0/0/7	1/M
<i>Corydoras panda</i>	Panda Catfish	-	-	-	-	0/nr	0/0/1	1/M
<i>Corydoras trilineatus</i>	Leopard Catfish	-	-	-	-	0/nr	0/0/1	1/M
<i>Corydoras undulatus</i>	Wavy Catfish	-	-	-	-	0/nr	0/0/12	A/M
<i>Hoplosternum littorale</i>	Hoplosternum Catfish	-	-	-	-	0/nr	0/0/2	1/M
<i>Heteropneustes fossilis</i>	Stinging Catfish	-	-	-	-	0/nr	0/0/2	1/M
<i>Ictalurus nebulosus</i>	American Bullhead Catfish	-	-	-	-	0/nr	0/0/1	1/M
<i>Ictalurus punctatus</i>	Channel Catfish	-	-	-	6	0/nr	0/0/0	1/na
<i>Ancistrus sp.</i>	Bristle-nosed Catfish	-	-	-	-	0/nr	0/0/1	1/M
<i>Hypostomus punctatus</i>	Suckermouth Catfish	-	-	3	-	0/nr	0/0/3	1/M
<i>Otocinclus affinis</i>	Dwarf Sucker Catfish	9	-	-	-	0/nr	0/0/9	1/M
<i>Peckoltia sp.</i>	Emperor Zebra Plec	-	-	1	-	0/nr	0/0/0	1/na
<i>Pterygoplichthys gibbiceps</i>	Sailfin Pleco	-	-	2	-	0/nr	0/0/1	1/M
<i>Malapterus electricus</i>	Electric Catfish	-	-	1	-	0/nr	0/0/0	1/na
<i>Synodontis angelicus</i>	African Spotted Catfish	-	-	-	-	0/nr	0/0/1	1/M

		1	2	3	4	5	6	7/8
<i>Partula taeniata</i> ssp. unknown (Ex)	Polynesian Tree Snail	0	9	8	0	2/0	0/0/4	1/M
<i>Partula taeniata</i> (Ex)	Polynesian Tree Snail	90	280	251	121	135/0	0/0/98	1/M
<i>Partula turia</i> (Ex)	Polynesian Tree Snail	0	555	732	0	40/0	0/0/32	1/D
<i>Partula turia</i> (E)	Polynesian Tree Snail	274	410	266	1			

		1	2	3	4	5	6	7/8
<i>Phollogryllus geertsi</i>	Cave Cricket	-	nr	nr	-	200/0	25/25/0	A/M
<i>Hemideina crassidens</i>	Wellington Tree Weta	-	-	11	-	0/nr	4/6/0	I/M
<i>Decticus verrucivorus</i> (E)	British Wart-biter Cricket	-	713	547	166	0/3159	0/0/0	I/B
<i>Gryllotalpa gryllotalpa</i>	Mole Cricket	17	-	1	7	6/0	2/1/0	I/M
Blattodea								
<i>Gomphaderina portentosa</i>	Malagasy Hissing Cockroach	-	nr	nr	20	20/0	8/10/0	A/B
<i>Periplaneta americana</i>	American Cockroach	-	nr	nr	-	500/0	250/250/0A/M	
<i>Periplaneta australasiae</i>	Australian Cockroach	-	nr	nr	-	50/0	25/25/0	A/M
Mantodea								
<i>Empusa pennata</i>	Praying Mantis	1	-	1	-	0/0	0/0/0	I/na
<i>Tenodera sinensis</i>	Chinese Mantis	3	400	nr	50	10/nr	0/0/0	A/B
<i>Sphodromantis sp.</i>	African Praying Mantis	-	-	13	-	0/0	0/0/0	A/na
Phasmatodea								
<i>Acrophylla wuelfingi</i>	Queensland Titan Stick Insect	-	nr	nr	-	30/300	0/0/0	A/B
<i>Eurycantha calcarata</i>	Indonesian Spiny Stick Insect	-	nr	nr	-	20/200	2/2/0	A/B
<i>Extatosoma tiaratum</i>	Macleay's Spectre Stick Insect	-	nr	nr	40	200/300	20/20	A/B
<i>Heteropteryx dilatata</i>	Malaysian Jungle Nymph	-	nr	nr	14	40/100	0/0/0	A/B
<i>Phyllium biculatum</i>	Leaf Insect	-	nr	nr	-	0/15	0/0/0	A/D
Coleoptera								
<i>Chrysocarabus olympiae</i> (E)	Olimpia's Ground Beetle	-	3	10	-	0/0	0/0/0	I/na
<i>Scarabaeus sp.</i>	African Dung Beetle	10	nr	5	-	0/nr	0/0/10	A/M
<i>Helicopriss sp.</i>	African Dung Beetle	2	nr	-	-	0/nr	0/0/2	I/M
<i>Canthon sp.</i>	American Dung Beetle	-	nr	10	-	0/nr	0/0/0	A/na
<i>Pachnoda marginata</i>	Marginated Chafer Beetle	10	nr	nr	-	30/nr	5/5/0	A/B
<i>Blaps sp.</i>	Desert Beetle	-	nr	15	-	0/nr	0/0/5	A/M
<i>Anthia sp.</i>	Domino Beetle	2	nr	-	-	0/nr	0/0/2	I/M
unknown sp.	St Helena Carabids	-	nr	15	-	1/nr	0/0/5	I/D
unknown sp.	'Citroen' Desert Beetles	-	nr	-	-	0/nr	0/0/2	I/M
Diptera								
<i>Drosophila melanogaster</i>	Fruit Fly	-	-	-	-	0/0	0/0/1	C/B
Lepidoptera								
<i>Bombyx mori</i>	Silkworm	100	nr	nr	-	0/400	0/0/0	A/M
<i>Heliconius melpomene</i>	Postman Butterfly	10	nr	nr	-	8/13	11/9/0	A/B
<i>Actias luna</i>	American Moon Moth	-	nr	nr	-	0/0	0/0/20	A/M
Hymenoptera								
<i>Ampulex compressa</i>	Jewel Wasp	17	nr	nr	-	10/nr	7/6/0	I/M
<i>Apis mellifera</i>	Honeybee	-	-	-	-	0/nr	0/0/3	C/M
<i>Atta cephalotes</i>	Leaf-cutting Ant	2	-	2	-	2/nr	0/0/1	C/M
<i>Formica rufa</i> (V)	Red Wood Ant	-	-	-	-	0/nr	0/0/1	C/M
Hemiptera								
<i>Oncopeltis fasciata</i>	Milkweed Bug	20	nr	nr	-	0/20	3/2/0	A/B
<i>Platymeris biguttata</i>	Assassin Bug	-	nr	nr	-	30/nr	0/0/5	A/B
Onychophora								
<i>Peripatidae</i>								
<i>Macroperipatus geayi</i>	Velvet Worm	2	-	-	-	1/0	0/1/0	I/N

Total: Invertebrates: 80 species; approx. 5150 specimens; 8 colonies

		1	2	3	4	5	6	7
<i>Tragelaphus spekei</i> *	Sitatunga	6	-	2	-	-	-	2/6
<i>Tragelaphus eurycerus</i> *	Bongo	5	-	2	1	-	2	1/3
<i>Boselaphus tragocamelus</i> *	Nilgai	34	-	14	12	8	-	1/25/2
<i>Bos gaurus</i> * (V)	Gaur	2	-	-	-	-	-	1/1
<i>Bos grunniens</i>	Yak	15	-	2	-	1	-	4/8/4
<i>Syncerus caffer nanus</i> *	African Buffalo	7	-	1	-	-	2	2/4
<i>Bison bison</i>	American Bison	2	-	1	-	1	-	1/1
<i>Bison bonasus</i> (V)	European Bison	7	-	1	-	-	-	2/6
<i>Hippotragus equinus</i> *	Roan Antelope	9	-	2	-	-	-	4/7
<i>Kobus ellipsiprymnus</i> *	Common Waterbuck	5	-	3	3	1	-	1/3
<i>Kobus megaceros</i> (V)	Nile Lechwe	5	-	2	-	-	-	5/2
<i>Oryx gazella gazella</i> *	Gemsbok	6	-	2	-	3	-	1/4
<i>Oryx dammah</i> * (E)	Scimitar-horned Oryx	24	-	9	-	4	-	6/23
<i>Damaliscus dorcas dorcas</i> *	Bontebok	3	-	-	-	-	3	-
<i>Antelope cervicapra</i> * (V)	Blackbuck	22	-	9	6	5	-	4/8/8
<i>Gazella thomsonii</i> *	Thomson's Gazelle	2	-	-	-	-	-	1/1
<i>Ovis montanus</i>	Musk Ox	3	-	-	-	1	-	1/1
<i>Ovis musimon</i>	Mouflon	1	-	-	-	-	-	0/1
<i>Ovis canadensis</i>	Bighorn Sheep	5	-	2	2	2	-	1/2
Domestic								
	Shire Horse	1	-	-	-	-	-	1/0
	Cream Pony	2	-	-	-	-	-	1/1
	Welsh Pony (Cream form)	1	-	-	-	-	-	1/0
	Oxford Sandy x Black Pig	1	-	-	-	-	-	0/1
	Belted Galloway Cattle	1	-	-	-	-	-	1/0
	Red Poll Cattle	3	-	-	-	-	-	0/3
	Jersey Cattle	-	2	-	-	-	-	1/1
	Manx Loghtan Sheep	1	-	-	-	1	-	-
	Lincoln Longwool	3	-	2	-	4	-	0/1
	Wensleydale Sheep	2	-	2	-	4	-	-
	Hampshire Sheep	16	-	11	1	16	-	1/9
	Windsor White Goat	19	-	-	-	2	2	7/8
Total: Mammals		1969	17(1)	206	82	95	82	1902

BIRDS

Casuariiformes								
<i>Dromaius novaehollandiae</i>	Emu	7	-	2	-	2	1	4/2
Sphenisciformes								
<i>Aptenodytes patagonica</i>	King Penguin	14	-	1	-	2	-	3/3/7
<i>Eudyptes cristatus</i>	Rockhopper Penguin	13	-	2	-	1	-	4/4/6
<i>Spheniscus humboldti</i>	Humboldt's Penguin	51	-	18	1	4	12	17/29/6
Ciconiiformes								
<i>Ciconia ciconia</i>	White Stork	10	-	4	1	-	-	1/2/10
<i>Eudocimus ruber</i>	Scarlet Ibis	12	-	6	1	1	-	2/4/10
<i>Phoenicopterus ruber ruber</i>	Rosy Flamingo	50	-	-	-	1	2	0/0/47
Anseriformes								
<i>Cygnus atratus</i>	Black Swan	4	-	3	1	3	-	2/0/1
<i>Cygnus melanocoryphus</i>	Black-necked Swan	1	-	-	-	-	-	0/1
<i>Cygnus cygnus</i>	Whooper Swan	5	-	-	-	-	3	1/1
<i>Coscoroba coscoroba</i>	Coscoroba Swan	1	1	-	-	-	-	1/1
<i>Anser indicus</i>	Bar-headed Goose	49	-	4	-	2	6	8/10/27
<i>Anser canagicus</i>	Emperor Goose	4	-	-	-	-	-	2/1/1

WHIPNADE WILD ANIMAL PARK

		1	2	3	4	5	6	7
MAMMALS								
Marsupialia								
<i>Macropus rufogriseus frutica</i>	Red-necked Wallaby**	490	-	-	-	-	-	6/7/450
Primates								
<i>Saimiri sciureus</i>	Squirrel Monkey (Black-capped form)	21	-	1	2	-	-	7/12/1
<i>Leontopithecus rosalia</i> (E)	Golden Lion Tamarin	2	-	-	-	-	-	1/1
<i>Pan troglodytes</i> (V)	Chimpanzee	9	-	-	-	-	-	6/3
Rodentia								
<i>Cynomys ludovicianus</i>	Prairie Marmot**	234	-	-	-	-	-	200
<i>Dolichotis patagonum</i>	Mara**	130	-	-	-	-	-	120
<i>Chinchilla laniger</i>	Chinchilla	2	-	-	-	-	2	-
Carnivora								
<i>Canis lupus</i> (V)	Grey Wolf	19	-	4	-	5	-	6/7/5
<i>Ursus arctos</i>	Brown Bear	6	-	-	-	1	-	1/4
<i>Ailuropus fulgens</i> (V)	Red Panda	2	-	-	-	1	-	1/0
<i>Helogale parvula</i>	Dwarf Mongoose	8	-	4	4	-	-	4/4
<i>Panthera leo</i>	Lion	2	-	-	-	-	-	1/1
<i>Panthera tigris altaica</i> (E)	Siberian Tiger	3	-	5	5	-	-	1/2
<i>Acinonyx jubatus</i> (V)	Cheetah	8	-	-	-	-	1	5/2
Pinnipedia								
<i>Zalophus californianus</i>	Californian Sealion	3	-	-	-	-	-	1/2
<i>Phoca vitulina</i>	Common Seal	1	-	-	-	-	-	1/0
<i>Halichoerus grypus</i>	Grey Seal	1	-	-	-	-	-	0/1
Proboscidea								
<i>Elephas maximus</i> (E)	Asian Elephant	3	-	-	-	-	-	0/3
Perissodactyla								
<i>Equus burchelli antiquorum</i> *	Common Zebra (Chapman's form)	1	-	-	-	-	-	1/0
<i>Equus grevyi</i> * (E)	Grevy's Zebra	8	1	1	-	-	2	2/6
<i>Equus hemionus onager</i> * (V)	Asiatic Wild Ass	10	-	-	-	2	-	2/6
<i>Equus przewalskii</i> * (Ex?)	Przewalski's Horse	14	-	5	-	-	-	9/10
<i>Rhinoceros unicornis</i> (E)	Asian One-horned Rhinoceros	3	-	-	-	-	-	2/1
<i>Ceratotherium simum simum</i> (V)	White Rhinoceros	9	-	1	-	-	2	2/6
<i>Diceros bicornis michaeli</i> (E)	Black Rhinoceros	2	-	-	-	-	-	1/1
Artiodactyla								
<i>Hippopotamus amphibius</i>	Hippopotamus	4	-	-	-	-	-	1/3
<i>Hexaprotodon liberiensis</i> (V)	Pygmy Hippopotamus	3	-	2	-	-	-	2/3
<i>Lama lama</i> *	Llama	2	-	-	-	-	-	2/0
<i>Camelus bactrianus</i>	Bactrian Camel	12	2(1)	3	-	-	1	4/12
<i>Muntiacus reevesi</i>	Reeves's Muntjac**	20	-	-	-	-	-	30
<i>Dama dama</i>	Fallow Deer	18	-	7	1	1	-	6/8/9
<i>Axis axis</i> *	Axis Deer	50	-	21	9	4	2	16/30/10
<i>Axis porcinus</i> *	Hog Deer	48	-	15	12	7	4	17/18/5
<i>Cervus dussumieri</i> * (E)	Barasingha	29	-	8	5	3	-	11/15/3
<i>Cervus nippon taiouanus</i> *	Sika Deer	50	-	17	8	6	-	14/29/10
<i>Cervus elaphus</i>	Red Deer	109	12	18	-	6	49	4/79/1
<i>Elaphurus davidianus</i> * (E)	Père David's Deer	80	-	21	10	4	9	13/33/32
<i>Rangifer tarandus</i>	Reindeer	4	-	1	-	-	-	1/4
<i>Hydropotes inermis</i> (V)	Chinese Water Deer**	320	-	-	-	-	-	350
<i>Giraffa camelopardalis</i> *	Giraffe	1	-	1	-	-	1	1/0
<i>Giraffa camelopardalis reticulata</i> *	Reticulated Giraffe	5	-	-	-	1	-	2/2
<i>Tragelaphus angasi</i> *	Nyala	10	-	4	1	1	-	2/10
Falconiformes								
<i>Haliaeetus leucoccephalus</i>	Bald Eagle	1	-	-	-	-	-	0/1
<i>Gyps africanus</i>	African White-backed Vulture	1	1	1	-	-	1	0/1/1
<i>Gyps rueppelli</i>	Ruppell's Griffon Vulture	3	-	-	-	-	-	1/2
<i>Accipiter nisus</i>	Eurasian Sparrowhawk	1	1	-	-	-	1	0/1
<i>Parabuteo unicinctus</i>	Harris' Hawk	2	-	-	-	-	2	-
<i>Falco biarmicus</i>	Lanner Falcon	4	-	-	-	-	-	3/1
<i>Falco cherrug</i>	Saker Falcon	1	-	-	-	-	-	1/0
Galliformes								
<i>Gallus gallus</i>	Red Jungle Fowl	25	-	-	-	-	4	10/10/1
<i>Crossoptilon crossoptilon</i> (V)	White Eared Pheasant	1	-	-	-	-	1	-
<i>Pavo cristatus</i>	Common Peafowl**	150	-	-	-	-	-	140
Gruiformes								
<i>Grus japonensis</i> (V)	Red-crowned Crane	3	-	-	-	-	-	1/2
<i>Grus vipio</i> (V)	White-naped Crane	6	-	-	-	-	1	2/3
<i>Grus rubicunda</i>	Brolga	3	-	2	2	-	-	2/1
<i>Grus paradisea</i> (V)	Stanley Crane	6	-	2	1	-		

		1	2	3	4	5	6	7
Passeriformes								
<i>Carpodacus mexicanus</i>	Mexican Rose Finch	6	-	-	-	-	6	-
Total: Birds		538	6(1)	47	8	33	47(1)	493
REPTILES								
Testudines								
<i>Testudo hermanni</i> (V)	Hermann's Tortoise	9	-	-	-	-	-	2/7
<i>Testudo kleinmanni</i> (V)	Egyptian Tortoise	4	-	-	-	-	-	3/1
<i>Testudo horsfieldi</i>	Horsfield's Tortoise	-	10(10)	-	-	-	-	6/4
<i>Geochelone denticulata</i>	Yellow-footed Tortoise	3	-	-	-	-	-	1/2
<i>Chelus fimbriatus</i>	Matamata	2	-	-	-	-	-	1/1
Crocodylia								
<i>Osteolaemus tetraspis</i>	West African Dwarf Crocodile	6	-	5	-	-	-	5/2/4
Sauria								
<i>Phelsuma madagascariensis</i>	Day Gecko	5	-	-	-	-	5	-
<i>Eublepharis macularius</i>	Leopard Ground Gecko	4	1	8	-	-	9	1/3
<i>Basiliscus plumifrons</i>	Plumed Basilisk	2	-	-	-	-	-	1/1
<i>Iguana iguana</i>	Common Iguana	4	1	-	-	2	-	2/1
<i>Eumeces schneiderii</i>	Schneider's Skink	1	-	-	-	-	-	0/0/1
<i>Scincus scincus</i>	Sand Fish	2	-	-	-	1	-	0/0/1
<i>Uromastyx hardwicki</i>	Indian Spiny-tailed Lizard	-	8	-	-	-	-	0/0/8
<i>Uromastyx aegypticus</i>	Egyptian Dabb Lizard	2	-	-	-	1	-	0/0/1
<i>Anolis carolinensis</i>	Carolina Anole	2	-	-	-	1	-	0/0/1
<i>Anolis sagrei</i>	Brown Anole	1	-	-	-	-	-	0/0/1
<i>Ameiva sp.</i>	Ameiva	1	-	-	-	-	-	0/0/1
<i>Varanus exanthematicus</i>	Bosc's Monitor	3	5	-	-	-	-	4/0/4
Serpentes								
<i>Python molurus bivittatus</i> (V)	Burmese Python	5	-	-	-	-	4	0/1
<i>Corallus enydris cooki</i>	Cook's Tree Boa	3	-	-	-	-	-	1/2
<i>Cerastes cerastes</i>	Horned Cerastes Viper	4	-	-	-	-	2	1/1
<i>Echis carinatus sochureki</i>	Saw-scaled Viper	7	-	2	1	-	-	0/0/8
<i>Eryx johnii</i>	Smooth Sand Boa	-	2	-	-	-	-	2/0
Total: Reptiles		70	27(10)	15	1	5	20	86
AMPHIBIANS								
Anura								
<i>Dendrobates auratus</i>	Black & Green Poison Arrow Frog	11	-	-	-	6	-	0/0/5
<i>Dendrobates truncatus</i>	Yellow & Black Poison Arrow Frog	2	5	-	-	-	-	1/1/5
<i>Ceratophrys ornata</i>	Wide-mouthed Frog	1	-	-	-	1	-	-
<i>Ceratophrys cranwellii</i>	Wide-mouthed Frog	-	1	-	-	-	-	1/0
Total: Amphibians		14	6	-	-	7	-	13

SUMMARY

	1	2	3	4	5	6	7	Number of species (excluding domestic)
London Zoo								
Mammals	760	121	313	60	124	269 (1)	741	83
Birds	623	92(1)	132	38	71	153 (1)	585	128
Reptiles	243	185	79	3	36	121(10)	347	96
Amphibians	147	16	63	20	83	89	34	9
Total	1773	414(1)	587	121	314	632(12)	1707	312
Estimated number of fishes and invertebrates in the Collection at 31 December 1994:								
Fishes	Approx. 2280 specimens		194 species					
Invertebrates	Approx. 5150 specimens (+ 8 colonies)		80 species					
Whipsnade Wild Animal Park								
Mammals	1969	17 (1)	206	82	95	82	1902	58
Birds	538	6 (1)	47	8	33	47(1)	493	52
Reptiles	70	27(10)	15	1	5	20	86	22
Amphibians	14	6	-	-	7	-	13	3
Total	2591	56(12)	268	91	140	149(1)	2494	135
Note: Births, deaths, arrivals and departures of free-ranging animals at Whipsnade are not recorded.								
Estimated number of fishes and invertebrates in the Collection at 31 December 1994:								
Fishes	Approx. 98		15 species					
Invertebrates	Approx. 21 (+ 2 colonies)		10 species					
Grand Total Zoological Society of London								
	4364	470	855	212	454	781	4201	407*

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

TREASURER'S REPORT

The Society as a whole achieved a substantial surplus of £1,382,000 for the year, compared to a deficit of £203,000 in the preceding year. This result was significantly affected, however, by the major capital donations and the proceeds of the insurance claim resulting from the fire at Whipsnade in 1993.

The results of the previous year, 1994, have been restated so as to charge to income from operational divisions depreciation previously charged directly to the Development Fund, to include the Restricted Funds and to value investments at market value. The principal effect of these changes is the increase of £695,000 in depreciation now charged to operations, which has reversed the surplus previously shown. These changes have been made in order to bring the financial reporting further into line with current best accounting practice.

The Development and Endowment Funds have been merged with the General Fund to simplify the Society's financial reporting. Overall, we believe that this change, together with those detailed above, results in a clearer statement of the Society's financial position.

The Society is showing a deficit on its operations before the exceptional items. Importantly, however, the Society is now generating a cash surplus from the operations of all of its divisions. The underlying problem is the adequacy of income to cover the depreciation charges and the future funding of capital investment, funding for which this year has come largely from the exceptional capital donations and insurance claim proceeds.

London Zoo achieved a substantial rise in income from visitors as a result of an increase of 96,157 (11 %) visitors over the preceding year. This extra income offset the reduction in direct support given by the Stamford Raffles Patron. This represents significant further progress towards consistent operating surpluses. Visitor numbers at Whipsnade declined by 8,075 (-2%) from the preceding year and income was also adversely affected by the aftermath of the fire. In spite of these factors, Whipsnade managed to generate an operational surplus - a highly satisfactory performance. The Institute of Zoology also achieved a surplus, although reduced from the exceptional year in 1994 which was influenced by the major deficit in 1993. Conservation and Consultancy, Publications, the Library and the Learned Society all achieved satisfactory operating results with significant improvements over the preceding year.

Capital expenditure of £2,963,000 has been undertaken this year, the major projects being the Ambika Paul Children's Zoo in London, the Cloisters Function Suite at Whipsnade and the refurbishment of animal housing within the Institute of Zoology. Significant contributions towards the backlog maintenance problem have been achieved both by these developments and by numerous smaller projects. The capital expenditure has been financed by the capital donations, the insurance claim proceeds, government grants and funds raised in earlier years and held for these purposes.

The Society is in the final, detailed negotiations for a new lease for the Regent's Park site. The main features of this will be a 60-year term commencing in 1995 with an initial rent-free period of 5 years. The rent payable beyond this term will be modest, being 10% of the admission income received from paying visitors in excess of one million per annum. The lease will require the Society to maintain the property in a full state of repair but it will allow the Society a 10-year period in which to remedy the current shortfall from this standard. The long lease term is very welcome and shows a positive commitment on the part of our landlord, the Department of National Heritage, to the future of the Society.

The Society looks forward to the future with confidence but recognises the major challenges which it faces. The requirement for the renovation and refurbishment of the premises at both Regent's Park and Whipsnade is ever present and must be central to our future plans. It remains the cornerstone of our objectives to keep costs under tight control and to seek further income generation from new sources.

H. WILKINSON, MA, FCA
Treasurer

SUMMARISED ACCOUNTS FOR 1995

Consolidated Revenue Account for the year ended 31 March 1995

	1995 £000	Restated 1994 £000
OPERATING INCOME		
Visitor admissions	6,114	5,458
Catering and shops	2,830	2,508
less: cost of goods sold	<u>(1,012)</u>	<u>(988)</u>
	1,818	1,520
Other zoo operating income	705	597
Government and other grants	2,633	2,804
Sales and fees	558	481
Subscriptions	146	138
Donations	541	870
	<u>12,515</u>	<u>11,868</u>
OPERATING EXPENDITURE		
Staff costs	6,760	6,664
Animal foodstuffs	332	338
Repairs and maintenance	371	416
Depreciation	918	927
Utilities and other overheads	2,661	2,282
Publicity and advertising	1,440	1,382
Administration	898	737
	<u>13,380</u>	<u>12,746</u>
OPERATING DEFICIT FOR THE YEAR		
	<u>(865)</u>	<u>(878)</u>
Interest and investment income	429	362
Consequential loss claim	93	11
Unrealised loss on market value of investments	<u>(131)</u>	<u>(57)</u>
	391	316
DEFICIT FOR THE YEAR BEFORE EXCEPTIONAL ITEMS		
	<u>(474)</u>	<u>(562)</u>
EXCEPTIONAL ITEMS		
Capital donations	1,076	218
Insurance claim proceeds	740	-
Surplus on sale of assets	40	141
	<u>1,856</u>	<u>359</u>
SURPLUS/(DEFICIT) FOR THE YEAR		
	1,382	(203)
TOTAL FUNDS BALANCE BROUGHT FORWARD		
	<u>10,641</u>	<u>10,844</u>
TOTAL FUNDS BALANCE CARRIED FORWARD		
	<u>12,023</u>	<u>10,641</u>

**Revenue Account by Division
for the year ended 31 March 1995**

Divisions:	1995 Surplus/ (Deficit) £000	1994 Surplus/ (Deficit) £000
Zoological Gardens		
London Zoo	319	(482)
Whipsnade Park	<u>951</u>	<u>(6)</u>
	<u>1,270</u>	<u>(488)</u>
Scientific		
Institute of Zoology	62	232
Conservation and Consultancy	3	(27)
Publications	66	5
Library	(67)	(107)
Learned Society	<u>53</u>	<u>42</u>
	<u>117</u>	<u>145</u>
ZSL Development Trust	53	50
Other Designated funds	(63)	27
Restricted funds	<u>5</u>	<u>63</u>
Surplus / (deficit) for the year	<u>1,382</u>	<u>(203)</u>

The summarized accounts are extracted from the Society's full annual accounts as supplemented by additional information to operating income and expenditure. These summarized accounts may not contain sufficient information to allow for a full understanding of the financial status of the Society. For further information, the full Society's accounts and the auditors' report thereon should be consulted. While the auditors' opinion of these accounts is unqualified, their report contains no assurance or paragraph dealing with the fundamental uncertainty concerning the level of financial resources available to the Society under the current legislation. A full set of the Society's accounts is available on request from the Clerk to the Council.

**Consolidated Balance Sheet
at 31 March 1995**

	1995 £000	1994 £000
FIXED ASSETS		
Tangible assets	7,202	5,170
Investments	<u>1,630</u>	<u>1,737</u>
	<u>8,832</u>	<u>6,907</u>
CURRENT ASSETS		
Stocks	386	403
Debtors	1,105	1,016
Cash at bank and in hand	<u>4,541</u>	<u>4,607</u>
	6,032	6,026
CREDITORS: amounts falling due within one year	<u>(2,571)</u>	<u>(2,292)</u>
NET CURRENT ASSETS	3,461	3,734
Deferred capital grant	<u>(270)</u>	<u>-</u>
	<u>3,191</u>	<u>3,734</u>
TOTAL ASSETS LESS CURRENT LIABILITIES	<u>12,023</u>	<u>10,641</u>
FUNDS		
Development	-	5,816
ZSL Development Trust	581	528
Other Designated	1,353	1,461
Endowment	-	1,827
Restricted	401	396
General	<u>9,688</u>	<u>613</u>
TOTAL FUNDS	<u>12,023</u>	<u>10,641</u>

The summarised accounts are extracted from the Society's full annual accounts as supplemented by additional information relating to operating income and expenditure. These summarised accounts may not contain sufficient information to allow for a full understanding of the financial affairs of the Society. For further information, the full Society's accounts and the auditors' report on them should be consulted. While the auditors' opinion of those accounts is unqualified, their report contains an explanatory paragraph dealing with the fundamental uncertainty concerning the level of financial resources available to the Society to continue its usual operations. A full set of the Society's accounts is obtainable on request from the Clerk to the Council.

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ZSL 95

THE ZOOLOGICAL SOCIETY OF LONDON ANNUAL REPORT

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MISSION STATEMENT

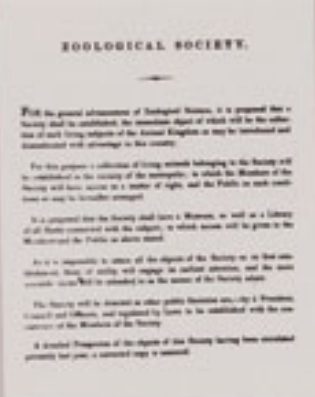
To promote the worldwide conservation of animals and their habitats by presenting outstanding living collections, breeding threatened species, increasing public awareness through information and education, conducting relevant research and undertaking action in the field. The ZSL pursues this mission by:

1. keeping and presenting animals at London Zoo and Whipsnade Wild Animal Park in accordance with best practice;
2. giving priority to species that are threatened in the wild;
3. increasing public understanding of animals and their welfare and of the issues involved in their conservation;
4. maintaining an outstanding education and information programme, particularly for schoolchildren and families;
5. undertaking field conservation programmes, both in Britain and abroad;
6. developing its role as a leading centre for research and conservation biology and animal welfare;
7. fulfilling its role as a Learned Society and force for zoology and animal conservation through publications, scientific meetings, lectures, the award of prizes for outstanding achievement and the promotion of conservation policy.



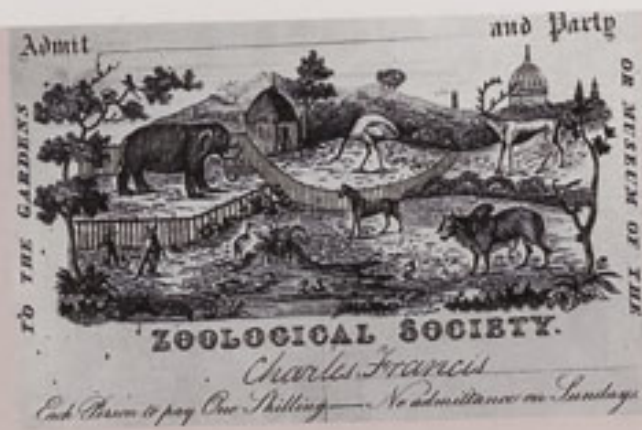
FOUNDED BY SIR THOMAS STAMFORD BAMPFYLDE

1826



PROSPECTUS

1826



EARLY SEASON TICKET

1829



DECIMUS BURTON APPOINTED ARCHITECT EAST TUNNEL/GIRAFFE HOUSE

1830



When a Society is over 150 years old, each passing year seems no more than a step on a well-trodden road. But 1995 was an important year for the Zoological Society of London. It saw steady financial progress, with a growth in our assets and profitability. This enhanced security in turn made it easier for us to focus our activities on our longer-term mission rather than on the immediacies of survival. The enhancement of facilities for animals and people at Regent's Park and Whipsnade continued. The new Children's Zoo in London proved a major attraction - and the Millennium Commission approved a £2.2 million grant for a new Conservation Education Centre. We had some notable successes in research and conservation. We continued to work in the field, in Saudi Arabia and Kenya as well as at home. There were some good scientific meetings and some excellent publications. **All these are important, for the ZSL is a professional organization, seeking to advance understanding of animal nature, to help its conservation and to let people see fascinating and beautiful creatures at close quarters. Our many activities reinforce one another. Science underpins the breeding of threatened species, the enhancement of their welfare in captivity, and their restoration to wild places from which they have disappeared - whether it be the gazelle in Arabia or the cricket in Kent. Education and information promote public understanding and enlist allies for nature - but the animals themselves are their own best ambassadors with a public that has come to view our collections in increased numbers. And we have worked hard to get our mission across - which is, perhaps, one reason why media coverage of our activities has been almost universally positive.**

The year saw an immensely important organizational change. Richard Burge took up office as Director General on 6 November. His role is to draw our specialist divisions together, to promote cohesion in our work and management, to make the whole greater than the sum of the parts and to work "upwards and outwards" to enhance the standing and reputation of the ZSL as a whole.

Conservation. Science. Education. Information. Professional Services. All are described in this Report. The quality and diversity of our activities make the ZSL unique. We have much more to do, but we are stepping confidently down the road.

SIR MARTIN HOLDGATE
PRESIDENT



64. Hippopotamus

1850
GRANTON, FIRST SHIP IN LONDON
BRITISH TRADES EXHIBITION IN GARDENS



1865
FISHING BOATS (1845) (1845) (17 YEARS)



1900
SIR MARTIN HOLDGATE (1900) (1900) (1900)



1921
KELLY ROBERT CAMPBELL
ON THE YOUNG CHIMPANZEE 'TOMMY'



The traffic jam on the road to the Whipsnade Zoo yesterday.

1931
SIR MARTIN HOLDGATE (1931) (1931) (1931)



1932
SIR MARTIN HOLDGATE (1932) (1932) (1932)



1939
SIR MARTIN HOLDGATE (1939) (1939) (1939)



1976
SIR MARTIN HOLDGATE (1976) (1976) (1976)

COUNCIL MEMBERS 1995

- PRESIDENT:
SIR MARTIN HOLDGATE, CB, MA, PHD, FIBIOL, FIBIOL, FRS. FORMER DIRECTOR-GENERAL ZSL. PREVIOUSLY CHIEF SCIENTIST, DEPARTMENT OF THE ENVIRONMENT.
- SECRETARY:
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- SHEILA ANDERSON, BSC. HEAD OF COMMUNICATIONS, NATURAL ENVIRONMENT RESEARCH COUNCIL.
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- SIMON BEARDER, PHD. PRINCIPAL LECTURER IN PHYSICAL ANTHROPOLOGY, OXFORD BROOKES UNIVERSITY.
- BRIAN BERTRAM, MA, PHD, FIBIOL. FORMER DIRECTOR GENERAL, WHISPOW & WETLANDS TRUST. PREVIOUSLY CURATOR OF MAMMALS, LONDON ZOO.
- JONATHAN BOYCE, DM, MA, MSC, MRCP, FPPHM. DIRECTOR, AUDIT COMMISSION.
- MICHAEL BRAMBELL, MA, VETMB, PHD. DIRECTOR OF NORTH OF ENGLAND ZOOLOGICAL SOCIETY, CHESTER ZOO AND PREVIOUSLY CURATOR OF MAMMALS OF LONDON ZOO.
- PROFESSOR BRYAN CLARKE, DPHIL, FRS. FOUNDATION PROFESSOR OF GENETICS, NOTTINGHAM UNIVERSITY (CO-OPTED MEMBER OF COUNCIL).
- STEPHEN COBB, DPHIL. DIRECTOR, THE ENVIRONMENT AND DEVELOPMENT GROUP, OXFORD.
- GEOFFREY CUTTING. RETIRED BBC SOUND EDITOR.
- JOHN EDWARDS, MA, FLS. SOLICITOR.
- PROFESSOR ANTHONY FARMER, PHD, CBIOL, FIBIOL, FLS, ARPS. PRINCIPAL, ANTHONY FARMER & ASSOCIATES.
- MICHAEL FORD, DPHIL. POLICY ADVISER, ENGLISH NATURE.
- PROFESSOR TIM HALLIDAY, DPHIL. HEAD OF BIOLOGY, OPEN UNIVERSITY.
- COUNCILLOR MARTIN JIGGENS, FRICS, FSWA. DEPUTY LORD MARCH OF WESTMINSTER, 1995/96. SURVEYOR (CO-OPTED MEMBER OF COUNCIL).
- JOHN KNOWLES, OBE. DIRECTOR, MARWELL ZOO.
- KEN LIVINGSTONE, MR.
- DAME ANNE McLAREN, DPHIL, FRS. WELLSOME CRC INSTITUTE, CAMBRIDGE, AND FOREIGN SECRETARY OF THE ROYAL SOCIETY (VICE-PRESIDENT).
- MARTIN ROWSON MA. CARTOONIST, ILLUSTRATOR AND WRITER.
- THE HON PEREGRINE SIMON, QC, FLS. BARRISTER (VICE-PRESIDENT).
- KEN SIMS. DIRECTOR, THURBY HALL WILDLIFE GARDENS.
- TONY STEVENS, MA, BVSC, MRCVS, DIPBACT. FORMER CHIEF VETERINARY OFFICER, MINISTRY OF AGRICULTURE, FISHERIES AND FOOD (VICE-PRESIDENT).
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- JANE THORNBACK, MSc. CO-ORDINATOR, UK TROPICAL FOREST FORUM.
- IAN WEBB, BSC(2CON), MBA, ECDROHIST.
- PROFESSOR ROGER WHEATER, OBE, CBIOL, FIBIOL, FRSA, FRSG(2CON), FRSE. DIRECTOR, THE ROYAL ZOOLOGICAL SOCIETY OF EDINBURGH.

In 1995, the Zoological Society of London (ZSL), has shown it has an increasingly important and recognized role in the conservation of animals and their habitats. The demand for our skills and services has grown in an environment where financial resources are limited and competition for organizations like us, which have to maintain commercial viability, is growing. Numbers of visitors to our two zoos in London and Whipsnade have grown by an overall 4.3%. We are now breeding 137 species of vulnerable or endangered animals, with a further 702 species breeding in the collections and on display to demonstrate the variety of animal life. The ZSL has 48 graduate scientists working on over 60 conservation projects in the UK and 27 other countries. Our education departments supported over 78,000 school visits. We published the scientific *Journal of Zoology* for the 165th year, and the 34th edition of the professional handbook, the *International Zoo Year Book*.

Our financial performance has demonstrated increasing strength through improving control of our costs and careful focusing on activities which directly support our mission. The net worth of the ZSL has grown by £2.5 million, and the operating surplus is now £642,000 – 5.9% of turnover and an improvement of £1.5 million on 1994. This has been achieved without the support of public funds through subsidy – a position which is unique amongst the major zoos of Europe and most of North America. It is even more remarkable when compared with the other “national” museums, gardens and galleries in London which all receive the majority of their operating funds from the public purse. While we have started to provide a solid financial bedrock for development, the ZSL still needs to raise funds for capital developments and conservation work through business partnership and sponsorship. By demonstrating that we are able to play a unique and effective role in conservation, science, and education, the ZSL is becoming more valued by the private sector.

The ZSL has had many successes in the past year.

Some are seemingly small but are nevertheless significant technical steps forward in the management of captive animals, conservation science and our field projects. These successes occur on a daily basis in the ZSL. The major and most significant events have included:

- the grant of £2.2 million from the Millennium Commission towards the construction of a national Conservation Education Centre in London;
 - winning two of the three BBC Wildlife Conservation Awards in 1995, one for the successful re-introduction in partnership with English Nature of the near-extinct British field cricket, the other for the successful release of Arabian sand gazelles into the Empty Quarter of Saudi Arabia;
 - the government's agreement to the renewal of our Crown lease for London Zoo at Regent's Park for 60 years – the longest period in the history of the ZSL and a testament to our growing financial stability;
 - the birth of a female baby to our elephant Thi, who is on loan to Chester Zoo as part of the co-operative programme between the main zoos of Britain and Europe;
 - the granting of our new Royal Charter which has enabled the ZSL to reform its membership structure so giving us the opportunity to expand greatly our Fellowship;
 - the establishment of the first conservation genetics laboratory in the Middle East by ZSL, funded by the Kingdom of Saudi Arabia.
- The successes have been great but the pressures are growing.** There is increasing competition for visitors to our two zoos (our main source of income) from new leisure attractions in and around London.

There are ever larger numbers of endangered species whose only hope of survival may be captive breeding; but that is only possible when we know more about their reproductive biology. The loss of habitat through ineffective conservation measures and the lack of economic development for impoverished people continue. The demand for funds to support important causes increases while the sources of those funds decrease.

OUR PERFORMANCE



LONDON ZOO'S ANNE LOAN CAT PRODUCE THE FIRST KITTEN IN A YEAR

LATE 94



LONDON ZOO'S ANNE LOAN CAT PRODUCE THE FIRST KITTEN IN A YEAR

APRIL 95



THE NEW ROYAL CHARTER GRANTED TO THE SOCIETY

MAY 95



WHIPSNADE WILD ANIMAL PARK'S FIRST SUCCESSFUL BIRTH OF A SEA LION PUP

JUNE 95



The appropriate response is for the ZSL to focus on its unique strengths and skills, and to increase the commercial success of its operations. During 1996, changes will be made to ensure that we co-ordinate activity between divisions much more effectively, and avoid unnecessary duplication. We will develop the Animals in Action facilities at London Zoo and announcements will be made on another major development which will increase visitor numbers and promote conservation. With the arrival of two female Asian rhinos on loan from the Kingdom of Nepal, Whipsnade will become one of the major conservation centres for this highly endangered group of animals in Europe. New branding and licensing projects will be established to ensure that our archive collection and reputation earn income for the ZSL's activities. Two major conservation projects, funded by the European Development Fund, will commence on the Sinai Peninsula and in Sumatra. Our scientific publishing operation will be restructured to increase cost effectiveness, develop the markets for our existing titles, and launch a new major international scientific journal.

The ZSL has to ensure that its activities are business-like and commercially viable. But the reason is solely to pursue our mission of conserving animals and their habitats. The main tool we have at our disposal is our unique ability to combine top-quality scientific research with practical field conservation and the captive breeding of animals. Above all we can create a sense of wonder and amazement at the variety of life for millions of people. On this strength we will continue to build.

Neill Alexander

PROFESSOR R MCNEILL ALEXANDER
SECRETARY

Richard D A Burge

RICHARD D A BURGE
DIRECTOR GENERAL



6
A FINALIST FROM THE TIPP-EX
"ENDANGERED ANIMALS IN ART" COMPETITION
JULY 95

ROLF HARRIS, CHRIS TARRANT AND DANA, THE LEMUR IN
CAPITAL RADIO'S LIVE BROADCAST FROM LONDON ZOO
AUGUST 95



ROLF HARRIS SIGNS AUTOGRAPHS AT LONDON
ZOO DURING ZOO WATCH LIVE, ON BBC1
AUG-SEPT 95



Awards and Honours

Effective conservation of animals has to be based upon profound and accurate knowledge of animal species, how they function, how they interact with each other and with their environment, and what the likely consequences of any action – or failure to act – might be. In short, good conservation depends upon good zoology. The ZSL recognizes and encourages excellence in zoological research at all levels of achievement, by giving a wide range of awards each year. Council announced the following awards for contributions to zoology in 1995:

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 Sir Robert May, FRS, the Government's Chief Scientific Adviser, for his many distinguished contributions to theoretical ecology.

The Scientific Medal (awarded to zoologists 40 years of age and under, in recognition of scientific merit) to Dr AVS Hill, of the Institute of Molecular Medicine, University of Oxford, for outstanding contributions to knowledge of the mechanisms of genetic susceptibility to parasitic infection, particularly malaria; and to Dr JR Speakman, of the University of Aberdeen, for distinguished contributions to the study of animal energetics.

The Zoological Society of London

Marsh Award for Conservation

Biology (for contributions of fundamental science and its application

to the conservation of animal species and habitat) to Dr J D Goss-Custard, of the Institute of Terrestrial Ecology, for outstanding contributions to understanding of shorebird populations and to the management and conservation of these birds and their habitats.

The Thomas Henry Huxley Award

(for original work submitted as a doctoral thesis) to Dr P Stander, University of Cambridge, for his thesis 'Ecology and hunting behaviour of lions and leopards'.

The Prince Philip Prize (open for competition to pupils under 19 years of age, of schools or other places of education in the United Kingdom, the Channel Isles or the Isle of Man, on the basis of an account of practical work involving some aspect of animal biology)

to Dawson AH Mennie, of Banchory Academy, for his essay 'Behaviour in convict cichlids *Cichlasoma nigrofasciatum*'. The Marsh Award for Conservation Biology, The Thomas Henry Huxley Award and the Prince Philip Prize are sponsored by the Marsh Christian Trust.



THE ZOOLOGICAL SOCIETY OF LONDON
SILVER MEDAL (OBSERVE AND REVERSE)

Extinction catches up with one of world's slowest movers

By NICK NUTTALL, ENVIRONMENT CORRESPONDENT

THE last remaining specimen of a small tree snail that is one of the slowest movers on earth has died after a ten-year battle to keep the species from extinction.

Curators at London Zoo found *Partula turgida*, the Polynesian snail about the size of a broad bean, motionless in its plastic box. A zoo spokesman said its tombstone would bear the legend: "1.5 million years BC to January 1996."

The death of the snail, known to staff as Turgi, was discovered by Paul Pearce-

Kelly, assistant curator of lower invertebrates: "Species extinction is an almost certain daily phenomenon but actual documented cases of loss are relatively rare."

Studies in the wild indicate that this group of snails move at less than two feet a year. But Mr Pearce-Kelly said that they knew it had expired: "They are not so slow that you cannot tell they are dead."

The demise of *Partula turgida* marks another sad chapter in the tragic history of Polynesian tree snails, creatures that have become celeb-



Partula turgida became a celebrity with biologists

rities among evolutionary biologists and akin to Darwin's finches in importance.

The snails, which feed on the rotting stems of hibiscus trees, have engaged some of the best scientific minds since the turn of the century. Free

from predators, *Partula* evolved into 117 species in the Society Islands, northwest of Tahiti, all occupying distinct ecological niches. Some are still evolving or halfway between two different species.

However, in 1967 a local

entrepreneur introduced the giant African snail for farming. It is apparently delicious with soya sauce. But the snail escaped. Flame-throwers and poisons were used in an effort to control it until in 1978 a Florida snail was shipped in as a biological control.

Unfortunately the snail, *Euglandia rosea* and known as the Exocet of the snail world, preferred the taste of the tree snails. Within a decade it had wiped out 27 species of *Partula*.

Why *Partula turgida* passed away remains a mystery. A post-mortem examination will be carried out.





WART-BITER CRICKET
EATING SPERMATHECA

We currently care for 33 highly endangered species of snails from Polynesian islands, where the introduction of predatory species has destroyed the local populations. Our re-introduction of species extinct in the wild continues in specially protected areas.

In the UK we are expanding our work with English Nature with the release of more captive-bred field and wart-biter crickets into the wild. The field cricket programme has been so successful that it has been declared a safe species, and the ZSL received a BBC Wildlife Conservation Award in 1995 for this achievement.

With the Jersey Wildlife

Preservation Trust, we are working in Madagascar and the Comoros Islands on the conservation of lemurs and fruitbats in projects which link captive breeding in zoos with habitat conservation in the wild.

The causes of declines in animal populations and extinctions of species are often obscure. In many cases obvious factors such as habitat loss do not seem to be involved. Diseases and other sources of mortality may sometimes be key factors and ZSL has continued to make contributions of international importance to this field.

The ZSL's collaborative research on outbreaks of distemper in the lions of the Serengeti shows that the domestic dog population on the edge of the Park is the likely reservoir of infection. Studies are now proceeding to see if vaccination of the dogs will protect the wild-carnivore populations in the Park before another serious outbreak occurs.



DOMESTIC DOG IN AREA BORDERING
THE SERENGETI NATIONAL PARK

The worldwide trend in massive mortality of frogs has attracted significant public attention. Andrew Cunningham, on the ZSL's veterinary staff, is leading a major project to study the reasons for this decline in the UK. On the strength of this work, he has been invited to investigate possible viral causes for three months at the World Iridovirus Research Centre in Australia.

The ZSL leads the English and Welsh component of a Europe-wide project to investigate diseases and other causes of death in stranded porpoises and dolphins. This is a long-term veterinary project supported by the Department of the Environment, which has now been replicated in other countries.

The ZSL is responsible for the disease studies on red squirrel re-introduction projects throughout the UK. Genetic studies on Arabian gazelles, as part of the ZSL-managed project for the National Commission for Wildlife Conservation and Development to breed and re-introduce these endangered species, have provided valuable information and could be critical if other species of gazelle are to be preserved elsewhere in the world.

Our two zoos are at the heart of our work to conserve animals. For some species we can attempt re-introduction - but only when habitats have been safeguarded and the other threats to small populations of animals are understood and can be managed.

In the meantime, the animals in our two zoos enable us to preserve these species and increase our understanding of welfare needs and reproductive biology. Our policy is to ensure that we maintain captive populations which are sustainable. We belong to the conservation breeding programmes established in the UK and Europe for captive populations.

Seahorses are threatened by worldwide exploitation for traditional medicines and aphrodisiacs and as aquarium curios. Current levels of exploitation cannot be sustained.

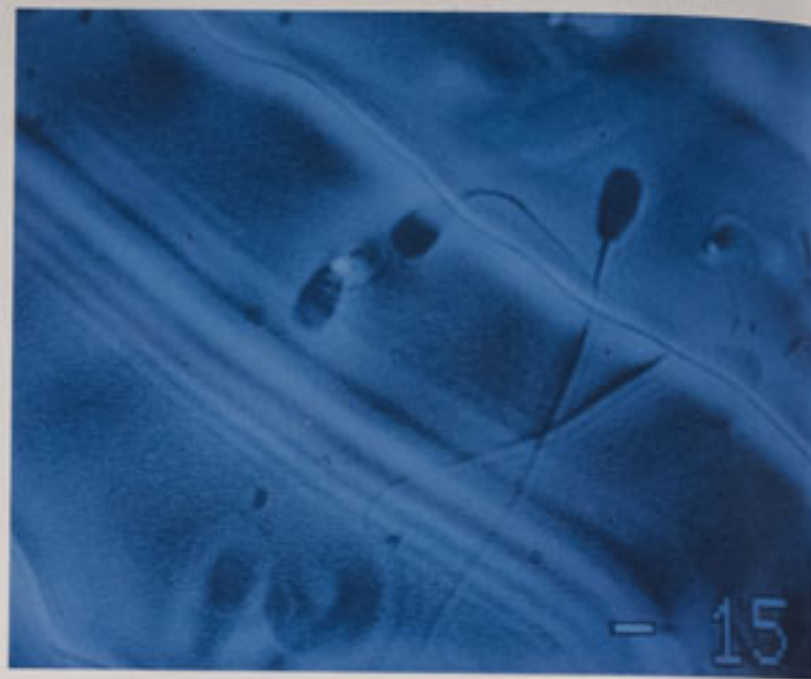
Seahorses do not usually survive long in aquaria but ZSL has made major strides in increasing the longevity of these extraordinary animals in captivity, and has led in the establishment of the group responsible for a controlled captive breeding programme.

The ZSL maintains self-sustaining breeding herds of important species in the large paddocks of Whipsnade, including Grevy's zebra, roan antelope, waterbuck and gemsbok. Their offspring make a major contribution to the UK and European captive breeding groups.



A SEAHORSE ADAPTED FOR
CAMOUFLAGE IN SEA GRASS BEDS





Successful conservation is dependent upon self-sustaining populations of animals. Key areas of scientific investigation are reproductive biology, genetics and disease; these are areas of priority research for the ZSL.

Our reproductive biology research group focuses on the production and preservation of semen in endangered species and on studies of environmental effects which may have serious consequences for sperm production in the testes. Methods are being developed to use tissue cultures of the Sertoli or nurse cells for sperm.

The preservation of sperm, eggs, and embryos are possible ways of maintaining genetic diversity in very small populations. The

techniques for storage and restoration are complex and highly individual to each species. The ZSL has developed important new techniques for monitoring death in sperm during the freezing processes, and improving the longevity and viability of stored sperm in a wide variety of species.

Using sophisticated molecular techniques to study genetic variation is one of the most important new developments in conservation. The ZSL has been investigating hidden or cryptic species, where physical differences between species are so small that they can only be identified by using DNA sequencing. For example, a project has been completed on pipistrelle bats in the UK and we are now undertaking work on bushbaby

species in Africa. Using genetics to help to identify distinct species ensures that conservationists do not overlook endangered species, and it increases our knowledge and ability to preserve biodiversity.

The ZSL has recently completed a worldwide study on genetic variation in the harbour seal to investigate gene flow in a highly mobile marine species. Such studies help us to define population units for conservation. Work on the DNA of wild African buffalo has shown that variation is increased with both the size of population and the area of the national park or reserve. It also showed that significant differences in gene frequencies were appearing between different parks. These results are

potentially important for the genetic management of small populations of endangered species in fragmented reserve populations where natural gene flow no longer occurs.

The ZSL is continuing to increase its contribution to field conservation with a larger number of long-term projects in the field. In Saudi Arabia, the ZSL's management of the King Khalid Wildlife Research Centre on behalf of the Kingdom of Saudi Arabia has entered its tenth year. From 100 sand gazelles released into the wild early in 1995, over 60 lambs have been born. This success is about to be followed by the release of a further 100. An additional site has been found for the re-introduction of mountain gazelles.

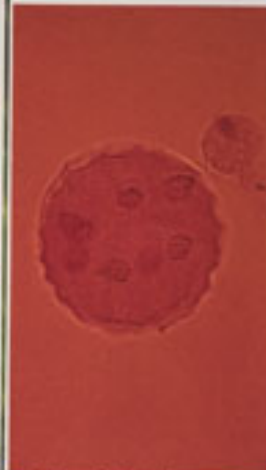
The secondment of Richard Kock from the ZSL to be the Senior Wildlife Veterinary Adviser to the Kenya Wildlife Service has entered its fourth year, 50% funded by the UK Overseas Development Administration. The veterinary unit has supervised translocation of elephant between parks, identified and contained an outbreak of rinderpest, and undertaken activity to stop the imminent extinction of the hirola (a type of hartebeest).

With the support of FINA plc and the Bush Ball, we have channelled funds to rhino conservation projects in Africa, particularly in Zimbabwe in the Savé Valley Wildlife Conservancy and, with the Zambezi Society, the Matusadona Intensive Protection Zone. Night sight equipment has been donated to the Natal Parks Board. Suzuki has continued its invaluable support of our Kenya rhino work through a joint promotion with Paul Mitchell.

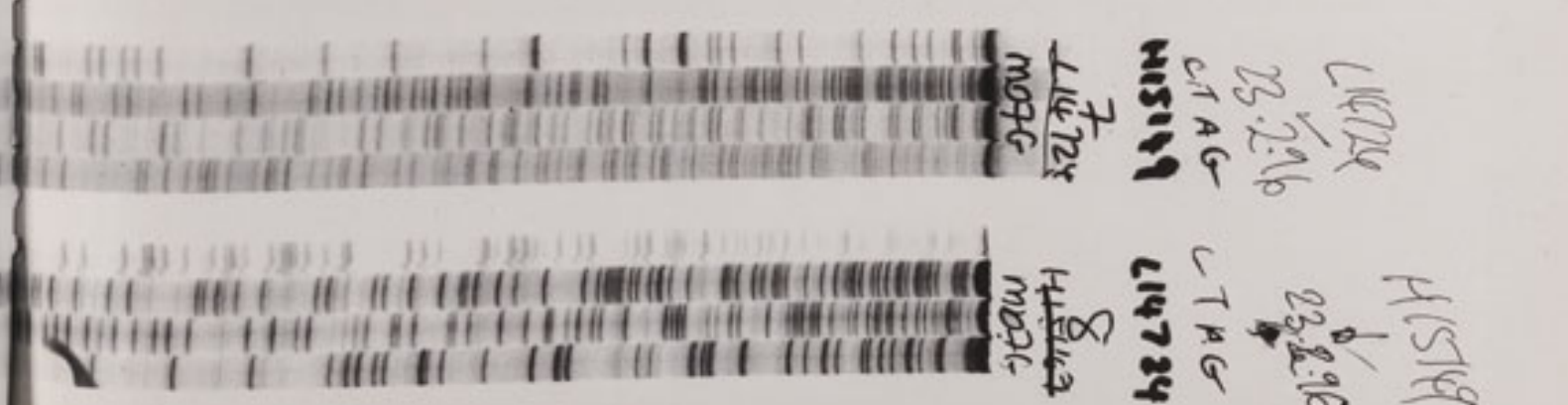
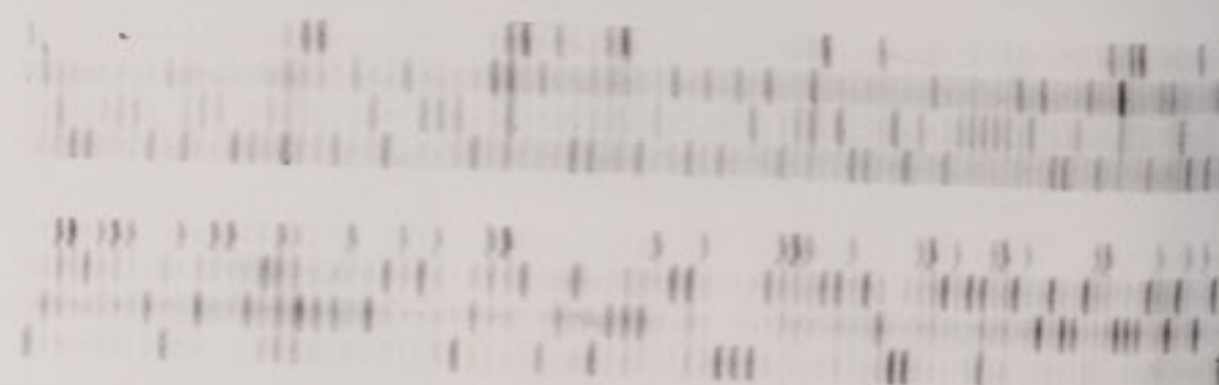


RED DEER EMBRYOS PRODUCED BY IN-VITRO FERTILIZATION

LESSER BUSHBABY SEEN HERE, UNUSUALLY IN DAYLIGHT, IN SOUTH AFRICA



AUTORADIOGRAPH SHOWING PART OF THE DNA SEQUENCE OF THE SOUTHERN LESSER BUSHBABY



Esso and London Zoo. A Model Partnership for Conservation.

Esso UK plc and London Zoo joined forces in 1994 to work for the continued survival of tigers. A close and unique relationship has developed which has worked to achieve and even exceed the initial sponsorship and conservation objectives agreed in the early days.

Esso, and its parent company Exxon,

are part of the Zoo's programme of support for "total conservation", which brings together both field and ex-situ conservation efforts.

The London Zoo/Esso partnership is internationally significant, high profile, and in many ways extremely profitable, not least for tigers.

Some of the exciting initiatives and activities which Esso has supported include:

The European Breeding Programme for Sumatran and Amur tigers.

The careful management of the 105 Sumatran and 240 Amur tigers in zoos throughout Europe is a vital component of metapopulation management and is co-ordinated by London Zoo's tiger expert. Three years' total funding from Esso has enabled this programme to develop by facilitating cooperation and by improving both communication and genetic management.

Public Awareness Campaigns through posters in Gatwick and Heathrow

and an advertising campaign in broadsheet newspapers. Highly visible and provocative messages communicate the importance of tiger conservation, whilst highlighting the close relationship of the Zoo and Esso, bringing corporate PR benefits.

The Sumatran tiger project. Based in Way Kambas National Park,

this is Sumatra's only tiger field project. Scientists are conducting a survey which is monitoring the population and ecology of Sumatran tigers. Directly by sponsoring, and through sales of toy tigers in the famous Tiger Tokens catalogue, Esso customers had the chance to contribute to wild tiger conservation, generating not only funds but also awareness of Esso's conservation support. A total of £100K was raised through Esso's 1995 retail tiger programme.

The first ever international conference in Russia for the ex-situ conservation of the Amur tiger, which was held in Moscow in 1995; the Action Plan from this meeting will be implemented in 1996. With support from the Exxon "Save the Tiger Fund" people were drawn together from all over Europe, including vets, zoo educationalists, conservation scientists, and tiger keepers, to focus efforts in zoos in order to make a real difference for the Amur tiger.

An extensive market research project to investigate children's perceptions and understanding of animal conservation. Still in progress, the report identifies the fears, hopes and desires of children.

As part of their world-wide programme for tiger conservation, to date Esso has supported London Zoo by over £220K.

The success of the London Zoo/Esso partnership is perhaps all summed up in the birth at London Zoo on 4 January 1996 of a Sumatran tiger

cub. With fewer than 800 Sumatran tigers in the world he is a very special cub, "born to lead" with the backing of Britain's leading oil company.

"Our partnership with London Zoo is a valuable and successful one, and shows how commercial partners can become involved with such crucial work. We are delighted that Mira has had this cub and hope that the Zoo's breeding programme produces more of this beautiful sub-species of tiger."
Denice Fennell, Esso Community and Government Affairs Manager



Co-operation among zoos is essential to successful conservation work.

Although the ZSL's animal collections are the largest and most diverse in Britain, they are still managed as part of the Joint Management of Species Programme of the Federation of Zoos of Great Britain and Ireland. This programme is one part of the activities of the Federation's Conservation and Animal Management Committee, chaired by the Curator of Whipsnade Wild Animal Park. Other ZSL staff sit on that committee or on the Joint Management of Species Committee, or both. ZSL staff chair four UK Taxon Advisory Groups (TAGs). The ZSL is also strongly represented in the European Association of Zoological Parks and Aquariums, and ZSL staff run seven European Endangered Species Breeding Programmes (EEPs).

The national and international zoo organizations set high standards of animal husbandry. They also keep studbooks of animals in captivity. Zoos devolve control of a particular species to a studbook keeper or co-ordinator, possibly outside the zoo, and most movement of animals between zoos now occurs as a result of recommendations from studbook keepers or Taxon Advisory Groups. These aim to ensure that animals are placed where their genetic contribution to the world's captive stock will be most valuable and where they will have the best possible chance of breeding successfully – particularly important in the case of rare and endangered species.



Animal collections are generally carefully planned, with clear goals in mind.

Some opportunities to add new species do arise unexpectedly. Illegal trade in wildlife leads to Customs seizures which can result in large numbers of sick and frightened animals needing homes at very short notice. The ZSL plays an important role in the care of such animals. Our primary goal, however, is that each animal in the collections should contribute to the aims of our Mission Statement – conservation and education – and that the ZSL should be a world leader among zoos co-operating for conservation.

PARTNERSHIP

EDUCATION AND INFORMATION

Pigs

Ponies

Pet Care Centre

The Red Barn

The conservation of animals and their habitats is dependent on the actions of well-informed people who find animals wonderful and amazing. People need to have a sense of the true worth and value of a diverse living world. The basis of this is effective education and information for the public on animals, and communicating the exciting science which underpins successful conservation.



BODY PATTERN OF A GORILLA'S SKIN

The ZSL's zoos in Regent's Park and at Whipsnade are the focus for our education work.

A growing number of staff are directly involved with the education process. The ZooWatch programmes presented by Rolf Harris on BBC TV provided people with exciting information and showed how two of the world's premier zoos care for their animals. A new series to be presented by Rolf Harris is being filmed at Whipsnade for transmission in the summer of 1996.

New systems of presenting information to the public (interpretation) are being introduced at Whipsnade and London. These colour panels with photographs are produced in-house. We achieve rapid turnaround enabling us to inform the public of changes (such as the birth of animals) quickly and effectively.

Over 35% of our visitors to London and Whipsnade are children. Most come though as part of activities organized through our education departments.

Both sites have special events teams. The species taking part include macaws, vultures, birds of prey, lemurs, sealions, lynx, ferrets, and kookaburras. These events are carefully developed to ensure that we demonstrate the natural behaviours of animals, and enable visitors to get a greater understanding of an animal's life. Over 1,000 events are presented annually. The sealion and bird demonstrations at Whipsnade are amongst the most varied and exciting in the UK and form an essential component of a visitor's experience.

Support is provided to older children as they reach the point when they may be deciding on their careers.

A Careers in Animals day focuses on enabling pupils to make informed choices about non-degree level careers.

Teachers' resources packs have been developed for topics which have particular importance in the National Curriculum and A-level courses. These can be used independently or as part of a visit to the zoos.

The Special Needs Day in June 1995 at London Zoo attracted over 1,060 people with physical or learning difficulties when specifically designed events and presentations were in place with support staff and sign-language interpreters.

Kids Out is a unique collaboration between Whipsnade and local Rotary Clubs to provide special visits to the Park for disadvantaged children - over 2,000 children have benefited to date.

A concern of the public is the stimulus and interest that captive animals receive from their environment. Animal management staff constantly change arrangements in enclosures, and provide challenges to animals, particularly in feeding, which make them use their behavioural skills as they would in the wild. The size of the space is not always the most important feature; it is what goes on within it that counts. Visitors now have far more information on how we make stimulating and interesting environments for our animals. In the Sobell Pavilions for apes and monkeys at London Zoo, support from Bridon Ropes plc and Kendon Packaging have enabled us to transform enclosures into a primate equivalent of an adventure playground.

The ZSL's strong conservation and science base with both the zoos

and field projects enables us to offer a wide range of teaching and training activities at a tertiary level.

The ZSL runs a MSc course in Wild Animal Health in partnership

with the Royal Veterinary College. Eleven veterinarians from seven countries graduated in 1995. The course covers many aspects of diseases, management, and medicine of free-living and captive animals relevant to conservation.

PhD training at the Institute of Zoology has continued to increase

and we now have 26 students registered for doctoral degrees. The range of species being studied is vast and includes red deer, zebra, naked mole-rats, komodo dragons, butterflies, social ants, and snails. The growth in this type of high-level training is a result of the increased professional and scientific standing of the Institute, and its tight focus on science which is relevant to effective conservation.

ZSL scientists run or participate in undergraduate and postgraduate courses, especially at University College London and the Royal Veterinary College.

PUBLICATIONS

JOURNAL OF ZOOLOGY

NINE PARTS OF THE *JOURNAL OF ZOOLOGY* - SOME 1600 PAGES ALTOGETHER - APPEARED DURING 1995. OF THE 120 PAPERS PUBLISHED, 45 CAME FROM THE UK AND THE REMAINING 75 FROM 21 OTHER COUNTRIES. DURING 1995, AN INTERNATIONAL EDITORIAL BOARD WAS APPOINTED. ITS MEMBERS REPRESENT A WIDE RANGE OF KNOWLEDGE AND EXPERIENCE. CHANGES WERE ALSO MADE IN THE PROCESS OF EDITING AND PRODUCTION. THE AIM IS TO REDUCE PRINTING COSTS BY ELIMINATING MOST OF THE TYPESETTING COSTS, AND TO ENSURE THAT THE ZSL IS WELL PLACED TO RESPOND TO ANY FUTURE TECHNOLOGICAL DEVELOPMENTS IN SCIENTIFIC PUBLISHING.

SYMPOSIA

ECOLOGY, EVOLUTION AND BEHAVIOUR OF BATS, VOLUME 67 IN THE SERIES *SYMPOSIA OF THE ZOOLOGICAL SOCIETY OF LONDON*, EDITED BY PROFESSOR P. A. RACEY AND DR SUSAN M SWIFT, WAS PUBLISHED IN DECEMBER.

ZOOLOGICAL RECORD

THE AMOUNT OF MATERIAL RELEVANT FOR INCLUSION IN *ZOOLOGICAL RECORD* CONTINUED TO GROW IN 1995 AND VOLUME SIZES WERE INCREASED TO ACCOMMODATE IT. *ZOOLOGICAL RECORD ONLINE* AND *ZOOLOGICAL RECORD ON CD ROM* WERE UPDATED AT REGULAR INTERVALS DURING THE YEAR, AND VOLUME 131 OF *ZOOLOGICAL RECORD* IN PRINT WAS PUBLISHED IN DECEMBER.

ALONG WITH INCREASES IN THE AMOUNT OF MATERIAL INCLUDED IN *ZOOLOGICAL RECORD* THIS YEAR, SEVERAL THOUSAND MORE ANIMAL NAMES AND BIOLOGICAL TERMS WERE ADDED TO THE INTERNAL FILES AGAINST WHICH NEW DATA ARE CHECKED.

INTERNATIONAL ZOO YEARBOOK

'AQUARIUMS' IS THE SPECIAL TOPIC IN SECTION 1 OF VOLUME 34 OF THE *INTERNATIONAL ZOO YEARBOOK*, PUBLISHED AT THE END OF 1995. THE 19 ARTICLES IN THIS SECTION REFLECT THE INCREASING POPULARITY OF PUBLIC AQUARIUMS AND RANGE FROM REVIEWS OF THE ROLES OF AQUARIUMS AND THEIR FUTURE DEVELOPMENTS TO THE SPECIALIZED BREEDING REQUIREMENTS OF UNUSUAL SPECIES.

IT CONTAINS A DIRECTORY OF ZOOS AND AQUARIUMS, TOGETHER WITH THE INDEX AND LIST OF REGIONAL AND NATIONAL ASSOCIATIONS FOLLOWED BY A LIST OF VERTEBRATE SPECIES BRED IN CAPTIVITY IN 1993, A CENSUS OF RARE ANIMALS IN CAPTIVITY AS AT 1 JANUARY 1994 AND AN UP-TO-DATE LIST OF AUTHORIZED INTERNATIONAL STUDBOOKS AND REGISTERS.

THE SENIOR EDITOR, PETER OLNEY, CONTINUES HIS WORK AS CO-ORDINATOR OF THE 150 INTERNATIONAL STUDBOOKS AND WORLD REGISTERS.



VETERINARIANS ON THE MSc COURSE EXAMINING A PELICAN IN THE ANIMAL HOSPITAL



We are also contributing to education and the transfer of skills internationally. Many members of the ZSL staff travelled overseas to zoos, wildlife reserves and professional conferences in 1995. On these visits, staff deliver seminars and talks, and conduct training workshops.

The ZSL staff at Whipsnade have devoted more resources to the long-term support we are providing through training to the government wildlife agency in Ghana. The team, led by the Curator at Whipsnade, Nick Lindsay, conducted workshops and gave technical advice in Accra.

With the support of the British Council, Paul Pearce-Kelly of the Invertebrate Conservation Centre conducted workshops in five Indian zoos on the conservation and captive breeding of rare invertebrates. This was linked to a major public information drive in India.

WORKSHOPS IN GHANA

THE JOINT TRAINING PROGRAMME WITH THE WILDLIFE DEPARTMENT IN GHANA IS THE TYPE OF WORK THAT THE ZSL CAN UNDERTAKE. THE PROGRAMME STARTED IN 1993 WITH THE TRAINING OF STAFF AT THE ZOOS IN KUMASI AND ACCRA IN ANIMAL HUSBANDRY. AS THE COURSE DEVELOPED IT WAS POSSIBLE TO INCLUDE IN THE SYLLABUS TOPICS MORE RELEVANT TO THE SENIOR STAFF OF THE COLLECTIONS WHICH INVOLVE MAN-MANAGEMENT AND THE DEVELOPMENT OF CAPTIVE BREEDING PROGRAMMES.

THE PROGRAMME HAS ALREADY SHOWN SIGNIFICANT RESULTS, MOST NOTABLY THE DEVELOPMENT OF THE CAPTIVE BREEDING AND RESEARCH CENTRE FOR DUikers AT KUMASI ZOO. IN THIS AREA THREE SPECIES OF DUiker, THE ROYAL ANTELOPE AND BUSHBUCK ARE BRED FROM ADULT ANIMALS WHICH WERE HAND-REARED AT THE ZOO. THE SUCCESS OF THE HAND-REARING WAS DIRECTLY ATTRIBUTABLE TO A COURSE DEDICATED TO THE TOPIC.

ALL THE STOCK IN THE ZOOS ARE ACQUIRED AS ORPHANED OR CONFISCATED STOCK. THE ZOOS THEREFORE PLAY AN IMPORTANT ROLE IN THE RESCUE AND REHABILITATION OF GHANAIAN SPECIES. AS THE ZOOS ARE MANAGED BY THE WILDLIFE DEPARTMENT, THEY HAVE AN IMPORTANT ROLE TO PLAY IN THE FUTURE OF CONSERVATION IN GHANA. AS THE KEEPING STAFF DEVELOP THEIR SKILLS, THEY WILL BE ABLE TO UNDERTAKE SPECIFIC BREEDING PROGRAMMES FOR SOME OF THE ENDANGERED SPECIES IN GHANA SUCH AS THE DIANA MONKEY AND THE WEST AFRICAN CROWNED CRANE. CAPTIVE-BRED OR RESCUED INDIVIDUALS COULD BE RETURNED TO HOLDING FACILITIES OR REINTRODUCTION SITES WITHIN THE NATIONAL PARK SYSTEM MANAGED BY THE WILDLIFE DEPARTMENT.

A NUMBER OF SPECIES HAVE VERY STRONG CULTURAL ROLES IN GHANAIAN SOCIETY, ALTHOUGH MANY OF THESE SPECIES MAY BE RARELY SEEN THESE DAYS. AS THE ZOOS DEVELOP AS REPRESENTATIVE COLLECTIONS, THEY BECOME VERY IMPORTANT EDUCATIONAL CENTRES PROVIDING THE VISITOR WITH AN OPPORTUNITY TO SEE THESE SPECIES CLOSE-TO AND LEARN ABOUT THEIR ROLE IN THEIR SOCIETY. SPECIES SUCH AS THE DUikers ARE RARELY MAINTAINED IN CAPTIVITY. ESTABLISHING A POPULATION OF SEVERAL SPECIES PROVIDES THE OPPORTUNITY FOR SCIENTIFIC STUDY OF THESE ANIMALS. INFORMATION GAINED THIS WAY MAY WELL AID THE DEVELOPMENT OF CONSERVATION PROGRAMMES AND MANAGEMENT STRATEGIES FOR THESE SPECIES IN THE WILD.

IN TRAINING ON SITE THE PROCESS BECOMES VERY COST-EFFECTIVE WITH EACH COURSE BEING ATTENDED BY UP TO 30 STAFF. IT ALSO ENABLES THE TRAINING TO FOCUS ON INDIGENOUS SPECIES IN THE FACILITIES AVAILABLE. THIS IS CRITICAL IF THE TRAINING IS TO BE SUCCESSFUL AS THE STAFF IN GHANA HAVE TO WORK WITHIN THE LOCAL CONSTRAINTS. SUCH A COURSE PROVIDES INVALUABLE EXPERIENCE FOR THE STAFF FROM WHIPSHADE. NOT ONLY DO THEY PASS ON THEIR SKILLS AND EXPERTISE BUT THEY ALSO GAIN THE OPPORTUNITY TO SEE FIRST-HAND THE PROBLEMS OF CONSERVATION IN COUNTRIES LIKE GHANA.

THE GHANA PROGRAMME IS ONLY POSSIBLE WITH THE SUPPORT OF THE **BRITISH AIRWAYS ASSISTING NATURE CONSERVATION PROGRAMME** AND FORMS JUST ONE OF MANY INTERNATIONAL CONSERVATION PROGRAMMES SUPPORTED THROUGH THE BRITISH AIRWAYS SCHEME.

WORKSHOPS IN INDIA

FOR THE LAST 17 MONTHS INDIA'S ZOO OUTREACH ORGANIZATION (ZOO) HAS BEEN WORKING HARD TO ADDRESS THE CURRENT LACK OF INVERTEBRATE CONSERVATION WORK IN INDIA. THESE EFFORTS HAVE BEEN GREATLY HELPED BY A CLOSE COLLABORATION WITH LONDON ZOO IN THE FORM OF FINANCIAL SUPPORT, THE PROVISION OF EDUCATIONAL MATERIALS AND THE DIRECT PARTICIPATION OF ZOO STAFF WITH THE TRAINING OF ZOO PERSONNEL AND THE HOLDING OF IN-COUNTRY WORKSHOPS.

RESULTS A £500 DONATION IN EARLY 1995 ENABLED ZOO TO CONDUCT A NATIONWIDE SURVEY OF INDIA'S UNIVERSITIES, ZOOS AND MUSEUMS WITH THE AIM OF CLARIFYING THE LEVEL OF INTEREST AND CURRENT ACTIVITY IN INVERTEBRATE CONSERVATION. THIS SURVEY HIGHLIGHTED THE CONSIDERABLE LEVEL OF INTEREST THESE ORGANIZATIONS HAVE IN BECOMING INVOLVED IN INVERTEBRATE CONSERVATION WORK. THE SURVEY ALSO CONFIRMED A VERY REAL NEED FOR ASSISTANCE IN THE FORM OF INFORMATION AND CO-ORDINATION FROM ZOO.

THIS INITIAL SURVEY LED ZOO TO HOLD A SERIES OF FIVE INVERTEBRATE CONSERVATION WORKSHOPS IN SOUTHERN INDIAN ZOOS. THESE WORKSHOPS WERE DESIGNED BY ZOO'S SALLY WALKER AND STAFF OF LONDON ZOO'S INVERTEBRATE SECTION WHO COLLABORATED WITH ZOO ON PRODUCING A SET OF GUIDELINES ON INVERTEBRATE DISPLAY AND CONSERVATION BREEDING. THE WORKSHOPS WERE HELD IN OCTOBER 1995 (WITH THE SUPPORT OF THE BRITISH COUNCIL AND BRITISH AIRWAYS ASSISTING NATURE CONSERVATION AND IN COLLABORATION WITH THE CENTRAL ZOO AUTHORITY) AND WERE A TREMENDOUS SUCCESS AT GENERATING INTEREST AND COMMITMENT.

LONDON ZOO IS ALSO ADVISING AND FINANCIALLY SUPPORTING DR B.A. DANIEL TO PRODUCE A MUCH-NEEDED HANDBOOK OF THE 126 PROTECTED INVERTEBRATE SPECIES. THE DATA THIS PROJECT WILL BRING ARE WIDELY ACKNOWLEDGED AS BEING INDISPENSABLE FOR REALIZING ANY EFFECTIVE INVERTEBRATE CONSERVATION WORK IN THE REGION. IN ADDITION TO THE ABOVE ASSISTANCE, ZOO'S PROGRAMME OFFICER, SANJAY MOLUR, SPENT TWO WEEKS IN THE SUMMER OF 1995 WORKING ON THE LONDON ZOO'S INVERTEBRATE SECTION, GAINING EXPERIENCE OF A WORKING INVERTEBRATE COLLECTION.



INDIAN INVERTEBRATE CONSERVATION WORKSHOP: PAUL PEARCE-KELLY AND SANJAY MOLUR

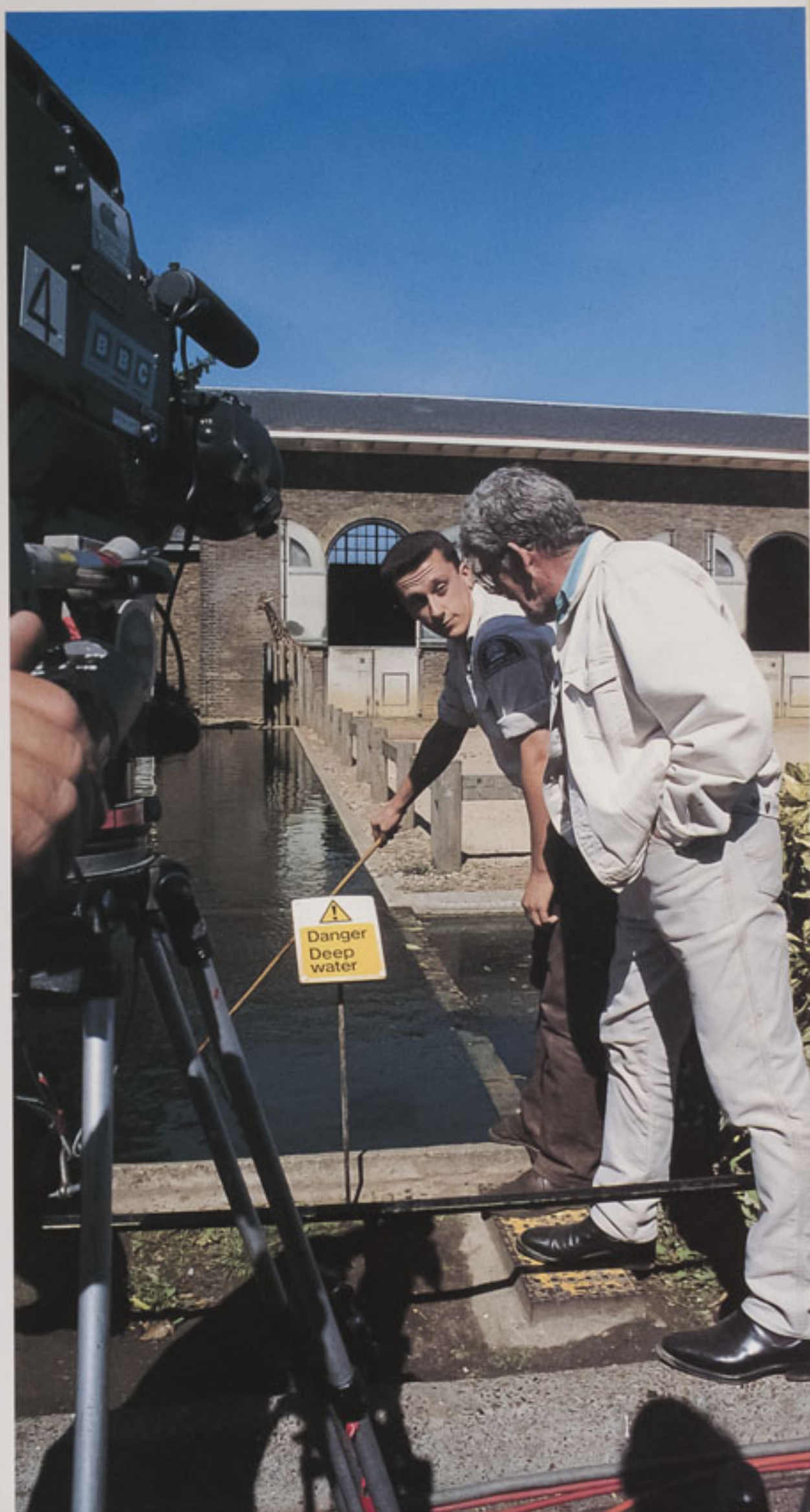




London Zoo and Whipsnade Wild Animal Park were brought into the homes of nearly 7 million people every night for a week during the summer of 1995. With his other presenter colleagues, Rolf Harris got deeply involved with the vets and keepers at the two Zoos to highlight the complex care and treatment needed for the wide variety of animals in the two collections. The stories covered ranged from a rhino's pedicure to anaesthetizing a red spitting cobra and from hand-feeding the baby giraffe that was born too tall to curing people of their fear of spiders. Zoowatch Live proved an enormous success with both our visitors and BBC viewers.

Thanks to Zoowatch Live those 7 million people who tuned in every night saw the conservation work in which zoos are now participating and how much care and attention is required to maintain such high standards in animal management.

In 1996, the same team from Zoowatch Live will be doing a series from Whipsnade Wild Animal Park to be broadcast from 16 May for 6 weeks.



PROFESSIONAL SERVICES

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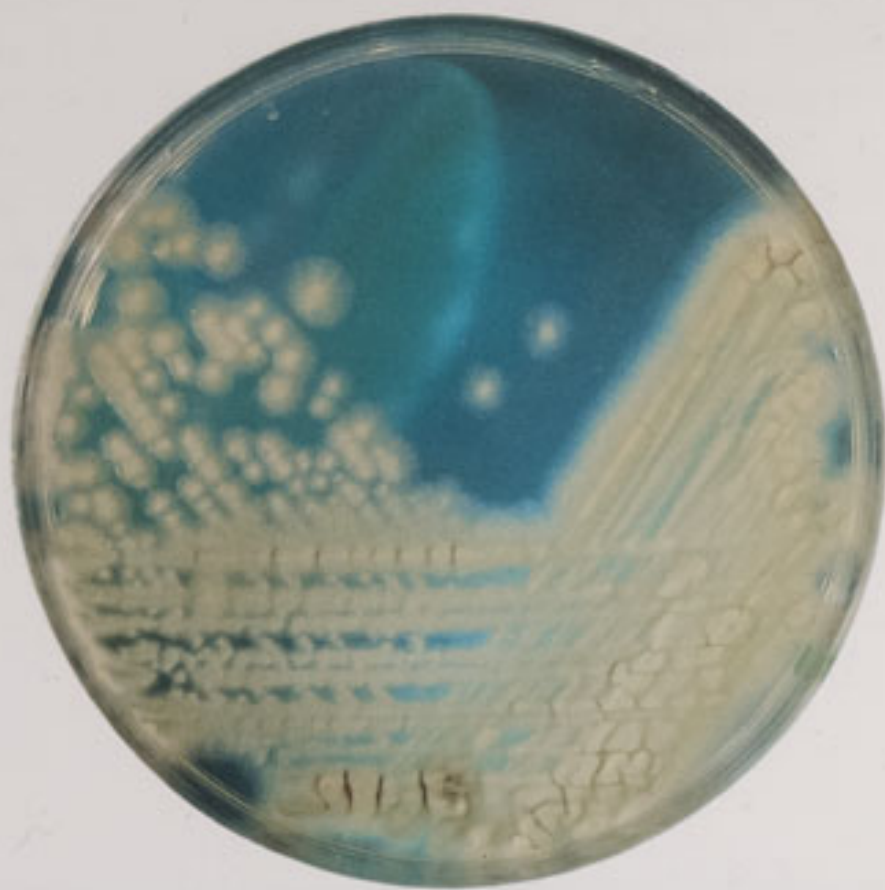
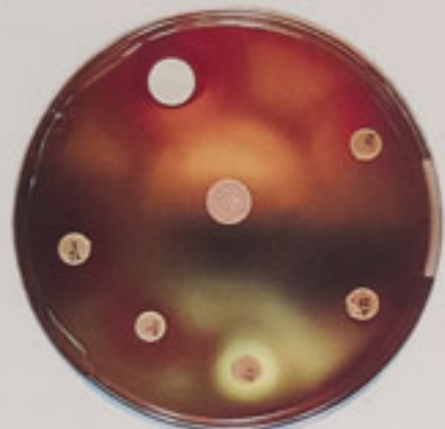


The specialist skills of the ZSL's staff and the facilities available at Regent's Park and Whipsnade enable us to offer a wide range of professional services to outside bodies. These activities positively expand our mission in the outside world, and act as a significant source of revenue for the ZSL.

The world of conservation is tightly knit and requires careful co-ordination. The lead organization is the IUCN – the World Conservation Union of governments and NGOs. The ZSL is a prominent participating member. The IUCN Species Survival Commission is composed of specialist groups: some are based around groups of species, others around inter-disciplinary topics such as conservation breeding and veterinary medicine. ZSL staff serve on many of these teams which form a unique network providing international advice on technical issues related to conservation including species assessment and planning, disease risk for translocated animals and re-introductions, and modelling of populations and their genetics.

Public advice for both individuals and organizations is a growing area of work. In 1995 we answered over 4,000 enquiries from the general public on animal matters and welfare. We were consulted on 6,500 occasions by the British and international media for expert advice on conservation and zoological issues - an average of 25 times each day. At times the number of enquiries can become overwhelming, and we are now putting new systems in place to enable us to provide this information faster and more effectively.

We have become far more proactive in the provision of advice on petcare. Many people keep inappropriate or rare species in their homes. Through our Animals in Action events, and our Petcare Centre in the Children's Zoo in Regent's Park, we actively promote the careful selection and care of pets for children and adults alike.





BLACK WIDOW SPIDER, IMPORTED IN A CAR FROM CALIFORNIA

Not all people are completely comfortable with animals, especially with spiders and snakes.

The ZSL ran eight arachnophobia sessions which are a combination of hypnotherapy, lectures and encounters with spiders in the Invertebrate House. A new development was a trial snake-phobia course. All are heavily oversubscribed.

The ZSL is often the recipient of illegally imported animals which have been seized by HM

Customs. In 1995, we accepted, treated and rehoused over 300 spur-thighed tortoises.

The ZSL has developed a number of important scientific and veterinary procedures for our own animal collections and conservation work. These are now made available to other zoos, environmental bodies and government.

The Reproductive Biology Group

has developed considerable expertise in the non-invasive monitoring of reproductive status in mammals. We are now offering this expertise to other zoos who need to know if their animals are pregnant or showing regular oestrous cycles. Information like this is crucial for the planning and implementation of captive breeding programmes, and the service we provide is unique in the UK.

The ZSL has developed and is organizing a Europe-wide initiative

to co-ordinate germplasm storage and preservation programmes for endangered wild animals.

ZSL veterinary staff provide information and advice

on the management and disease of free-living and captive wild animals to many UK and foreign governments and organizations. The veterinary care of zoo animals provides major opportunities to gather information on the biology, medicine and husbandry of species about which little is known. The ZSL has developed the LYNX database which enables the rapid retrieval of information on haematology and blood biochemistry to assist in the diagnosis of disease in a wide range of species.



HARBOUR PORPOISE TANGLED IN FISHING NETS, MORFA DIFFRIN NATIONAL NATURE RESERVE

Conservation of threatened species in the wild

increasingly depends upon the control of disease and the active management of small populations.

During 1995, the ZSL's vets have been involved as professional advisers in the UK

on disease in UK marine mammals, and the re-introduction programmes for red squirrel, red kite and English field crickets; in Tanzania on the distemper epidemic in the Serengeti; in the Philippines on re-introduction programmes for the eagle owl; in the Seychelles on the translocation of the magpie robin.

Our facility and hospitality services have developed significantly over

1995. Both Whipsnade and Regent's Park offer fine and unusual locations for filming and photography, conferences, and hospitality events. Receptions and pre-dinner events are held in the Small Mammal House, the Reptile House and the Elephant House in London, and at points of scenic splendour in Whipsnade. London Zoo can cater for banquets of up to 300 people. A fire in 1993 completely destroyed the facilities at Whipsnade. These have now been rebuilt and brought back into operation, with function suites that can cater for over 400 people in banqueting format. In 1995, over 307 hospitality events were held in London Zoo and 95 at Whipsnade. The ZSL provided a venue for over 90 meetings. **There has been an increase in the use of the two sites for filming and media events.** In London, scenes were shot for the new Disney film 101 Dalmatians, and a number of prime time radio shows were broadcast from the Zoo. The Secretary of State for National Heritage announced the first grants from the Millennium Commission at London Zoo. Whipsnade was used as a location for episodes of Soldier Soldier, Desmond Morris's new series Animal Country and Discovery Channel programmes. Both sites were also used for Channel 4's Big Breakfast, and fashion shoots took place by the Whipsnade penguin pool.



A BABY LEOPARD TORTOISE SHUGGLED FROM AFRICA AND SEIZED BY HM CUSTOMS. ON DISPLAY IN THE REPTILE HOUSE, LONDON ZOO

SERVICES

LONDON ZOO

London Zoo represents the largest component of the Zoological Society of London with £7.3 million turnover and 150 permanent staff. The Zoo achieves around 90% of its income from visitor-related activity, and continues successfully to maintain the balance between being part of a major conservation organization and the country's leading wildlife attraction.
Senior Executive: Dr Jo Gipps (Director of London Zoo).



Visitor numbers at London Zoo have continued to increase year-on-year, up 14% from the low-point three years ago when the Zoo was faced with closure; this was a good achievement in 1995, particularly because there was no major new attraction (compared with 1994 when the Extinction Exhibition was staged and the new Ambika Paul Children's Zoo was opened). 1995 was also a year of marked improvements in visitor facilities, including upgrading catering and retail outlets, installing over 300 new interpretation panels, improving exhibit visibility and establishing new quality standards for the cleanliness and state of repair of the grounds.

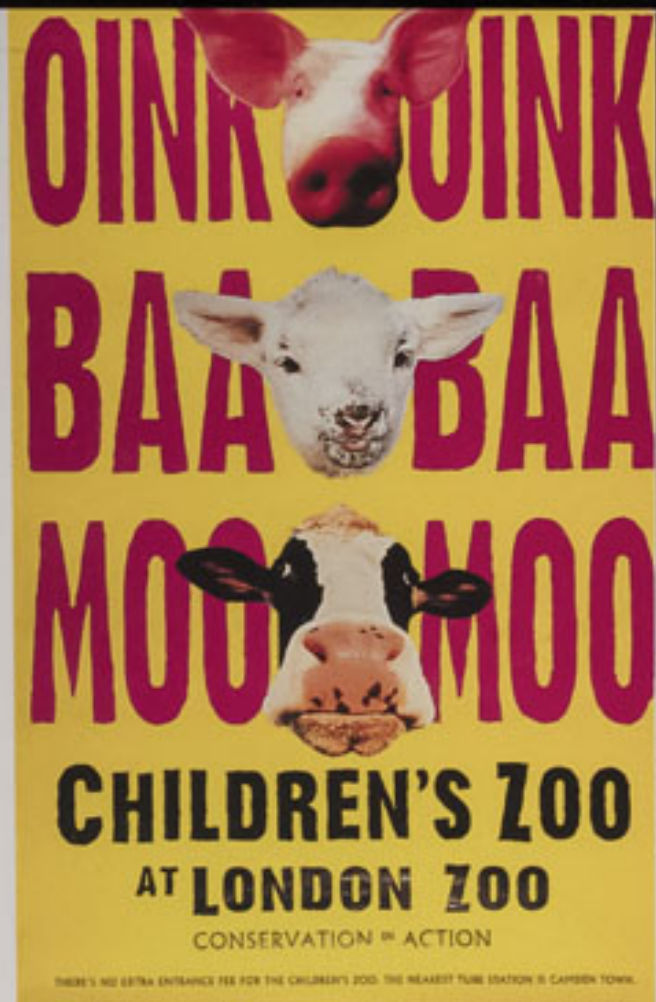
Rationalization of the animal collection towards more threatened species has continued, and London Zoo has made significant contributions to several field projects (lemurs, reptiles and bats on Indian Ocean islands, tigers in Indonesia, lions in India and macaws in South America). A core set of 10 field-related projects, working within and alongside the Society's "flagship" projects, is being developed to enable a significantly greater and more focused contribution to species conservation to be made.

London Zoo staff continue to contribute very significantly to external activities in all areas - in national, regional and international studbooks and species management programmes (at London Zoo more staff are involved in these important programmes than at any other UK zoo) and in marketing, fundraising and educational associations.

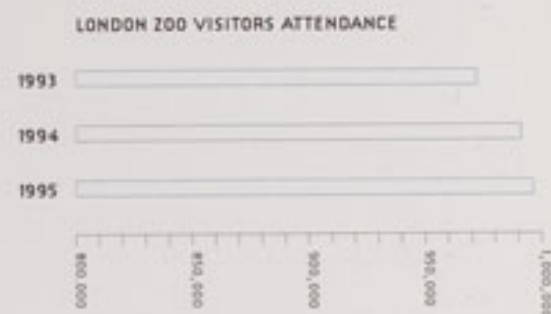
Marketing London Zoo, to attract new and repeat visitors and to increase Lifewatch membership and Animal Adoptions, has been a vigorous ongoing process, continuing the use of striking bus-side and underground posters, plus radio and newspaper advertising; proactive and well-organized public relations campaigns have ensured the continued and extremely high profile of London Zoo in the media throughout the year.

The major fundraising achievement of the year was securing £2.2 million in a grant from the Millennium Commission to build the Zoological Society of London's Conservation Education Centre at London Zoo. The centre will explain the concept of biological diversity, the threats facing it, what the conservation world at large is doing to preserve it, and the contributions made by the Zoological Society of London as part of that global process. The fundraising challenge for 1996 is to raise matching funds to secure the total project costs.

Other capital projects to be initiated in 1996 include the refurbishment of the Sealion Pool, and upgrading the facilities for Animals in Action and other daily events, including a new Birds of Prey demonstration. All of these developments will provide significant new reasons to visit London Zoo in 1996 and 1997, with the Conservation Education Centre scheduled to open in 1998/99.



LONDON ZOO UNDERGROUND POSTER, PART OF THE 1995 ADVERTISING CAMPAIGN



WHIPSNADE WILD ANIMAL PARK

Whipsnade was opened in 1931 and, until recently, had a poor financial record. After 25 years of losses the Park broke even in 1993 and is now enjoying its third year of surpluses. The turnover in 1995 was £3.3 million generating a surplus of £692K. The Division has a total of 74 full-time staff and employs a further 70 seasonal/casual staff during the peak season.

Senior Executive: Stuart Earley (Chief Executive of Whipsnade Wild Animal Park).



Marketing and Public Relations

was further refined in 1995 as part of a constant improvement process. Together with good weather and Zoo Watch this helped to achieve one of the best attendance figures for the past 20 years.

Christmas Wonderland was once again the biggest special event and occupied 6,000 square feet at the Farm. Almost 12,000 people were pre-booked for the event, which generated turnover of over £75,000 and provided a quality experience.

Liaison with the local community

has been strengthened with a series of local initiatives including more localized Board membership and enhanced relationships with local Chambers of Commerce and other organizations.

The new function suites were launched in May with a reception for the local business community attended by almost 200 people. Since then functions have been held for such quality organizations as British Telecom, Rank Xerox, Britannia Airways, Barclays Bank, Department of the Environment and Cabletel.

Park infrastructure has been improved substantially with major developments. These include new Function Suites – catering for up to 400 people in banqueting format – and new Cafe on the Lake – with wonderful views over the Park. The Mount Whipsnade Picnic Area opened with panoramic views over the Drive Thru' and Waterhole. The opening of the Bird Garden and Animal Care Centre

included an excellent display of the ZSL's work described by the Department of the Environment as one of the best CITES displays they had seen. The outside Tamarin Aviary was completed, the Discovery Centre was completely re-wired, graphics were renewed and refurbished throughout the Park. More sign boards and bus stops were introduced, helping visitors to find their way around with increasing ease. An open top double-decker bus replaced one of the Road Trains and has proved immensely popular with the public.

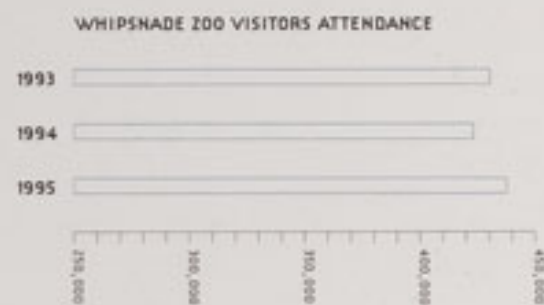
Massive investment has also been made in less glamorous items such as roads, fencelines, railway, toilets and car parks.

Park presentation reached new standards of excellence with visitors, members, staff and Council members saying that they have never seen Whipsnade looking so good.

Customer services expanded very well in 1995. Customer Care Seminars were held for all full-time and seasonal employees and training will be further enhanced in 1996 with additional sessions for volunteers and specific departments.

Whipsnade staff continue to play a major role within the Zoo community. Stuart Earley is Treasurer of the Zoo Federation, Nick Lindsay is Chairman of the Federation's Conservation and Animal Management Committee. Margaret Williams sits on the Education Committee and Linda Hughes has become a contact point for Federation Members for advice on Health & Safety matters.

Sponsorship during the year has included contributions from Lloyds Bank, Kodak, the Ellerman Foundation, American Friends of English Heritage and Amway.



CALIFORNIAN SEA LIONS
AT WHIPSNADE WILD ANIMAL PARK



THE INSTITUTE OF ZOOLOGY

The Institute's programme of research was delivered on time and a budget surplus of £46K was achieved. These results confirm that the Institute is operating on a sound financial basis and provide a good platform for further expansion of our programme in conservation biology. An account of the Institute's work was presented in the first of a new series of annual reports entitled Science for Conservation 1994. The report was designed by the prize-winning design consultants FOUR IV. Senior Executive: Professor Morris Gosling (Director of Science).



The Institute received core funding (£1.15 million for the nine-month financial period) from the Higher Education Funding Council for England.

Grant income totalled £1720K. New grants and contracts worth a total of £728K were won in the face of declining research budgets elsewhere and increasing competition. The largest single award was £482K from the Department of the Environment to the Veterinary Science Group for a five-year study of marine mammal strandings. Substantial grants and contracts were also gained from the Natural Environment Research Council, the Ministry of Agriculture, Fisheries and Food and a number of trusts and foundations.

The Institute appointed Dr Peter Cotgreave as its first Development Officer during 1995.

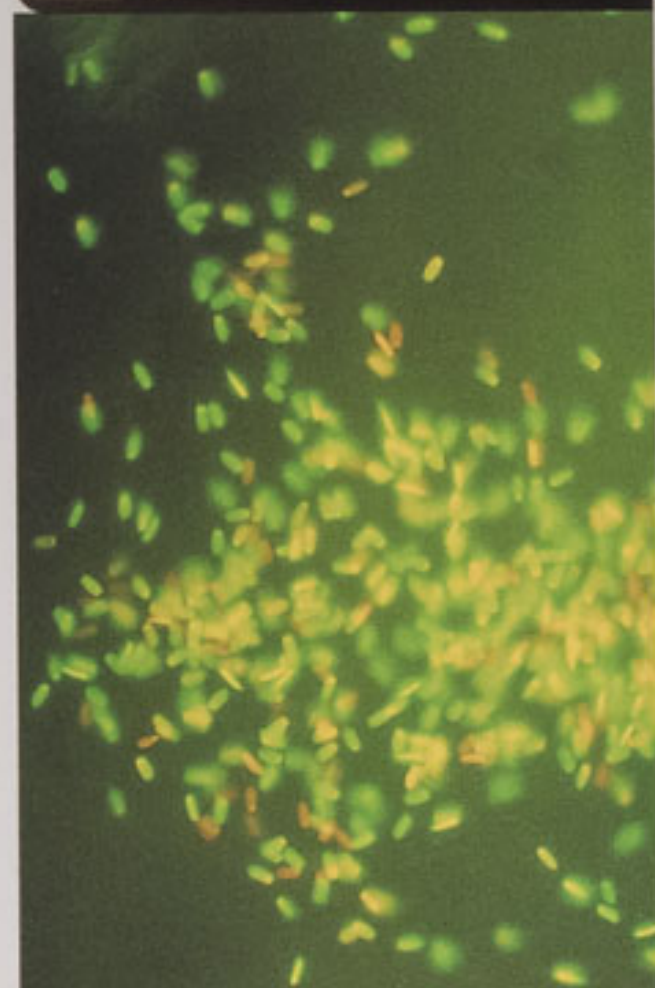
The aim of this appointment is to help raise funds for research which has direct links with animal conservation. This is the area of the Institute's work which is the least well funded by traditional sources of research funding such as the Research Councils. Dr Cotgreave is also an outstanding ecologist and will spend a third of his time in research on invertebrate community ecology. The Institute continues to place high priority on post-doctoral training with 26 students registered for the PhD degree. All but two of these are externally funded. Particularly gratifying are the three studentships awarded in 1995 by the Natural Environment Research Council. Although the number is modest, this represents an increase on previous years and is a recognition of the growing success of population ecology and genetics in the Institute.

The MSc in Wild Animal Health run jointly with the Royal Veterinary College shows every sign of continued success. Eleven students from eight

different countries started in October and there is a high level of interest from potential applicants. Up to the time of writing in January 1996, 94 enquiries and 43 applications had been received for the 1996/97 course, both an increase on the previous year. Most important, the quality of the students continues to be very high. All the current students are qualified veterinarians and most have additional experience, including research and veterinary practice.

The animal hospital at Whipsnade is in a poor state of repair and plans have been made during 1995 to replace it with a larger building. This will provide improved hospital facilities and accommodate teaching for post-graduate students, particularly those on the MSc course in Wild Animal Health. Reflecting the wishes of the largest single donor, the new building will be called the John Ellerman Centre and building is expected to start early in 1996.

The Institute continues to provide veterinary care for the ZSL's animal collections at Whipsnade and Regent's Park. Emphasis is placed on the prevention of disease through quarantine and screening of incoming animals, careful attention to infectious disease control programmes and nutrition, and rapid and thorough investigation of disease and mortality incidents. Other services to the Zoo community include the Reproduction Monitoring Service. Samples are analysed to provide information about reproductive cycles and confirmation of pregnancy in elephants and rhinos. Previously this service used blood samples but recent technical developments now allow accurate analysis of hormone metabolites in faeces and urine, thus avoiding the need for invasive procedures.



RADIOGRAPH OF AN ASIATIC LION'S PAW

BOAR SPERM LIVE (GREEN) / DEAD (RED) CELL ASSAY

VETERINARIANS ON THE MSc COURSE ATTENDING A REPTILE MEDICINE LECTURE

A GROUP OF WILD AFRICAN BUFFALO

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LEARNED SOCIETY

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Elizabeth H

Paul Getty

Thrupp

Harold Wilson

Jacqueline Kennedy

Daniel Attenborough

Edward Hees

The Learned Society division comprises the Library, the Publications Department and the Fellowship support office. Turnover in 1995 was £633K. The division made a surplus of £52K. There are 11 staff. Senior Executives: Academic policy: Professor Morris Gosling (Director of Science); Budget and financial responsibilities: Peter Denton (Clerk to the Council).

32

Handwritten scribbles and lines.

18
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64

Henry Moore

Snowdon



The division operates as three self-contained units. The Library maintains its pre-eminence as the largest collection of zoology books in private ownership in the country. Over 3,500 people visited the Library and 1,800 enquiries were received from the general public.

Separate evening tours of the Library were held for Fellows and Lifewatch members and Friends of Regent's Park, participants being invited to view the archive collection of rare books, prints and paintings as well as modern technology such as CD-ROM and the Internet. A selection of paintings from the ZSL's archive was conserved thanks to a donation from

The Pilgrim Trust and the 'Sponsor a Picture' campaign was launched amongst the Fellowship. A team of Volunteers was trained to undertake minor repairs to the older books in the collection, the opportunity being taken to assess the overall condition of the books and their relevance to the collection. The Library's serial holdings have been computerized thanks to a grant from the Lord Zuckerman Memorial Fund. Notable acquisitions include an extensive collection of important historical postcards of London Zoo. 560 new books were added to the collection.

The ZSL's photographic collection, housed in the Library, continued to draw attention from picture editors and historians. It proved a useful source of income amounting to £11,000.

The series of Scientific Meetings continued with a stimulating programme.

The Tuesday Talks, aimed at a wider audience, again drew a variety of speakers culminating in the President, Sir Martin Holdgate, speaking on the occasion of the Sir Stamford Raffles Memorial Lecture on 'What future for nature?'. The evening had been sponsored by the

Singapore Tourist Promotion Board, and Singapore Airlines most generously donated a holiday for two in Singapore.

The Journal of Zoology maintained its position as a pre-eminent journal dedicated to academic zoology.

The International Zoo Yearbook has been published by the ZSL regularly since 1959. Greater emphasis is now placed on detailing endangered species bred in captivity although the index to zoos throughout the world remains as useful as ever.

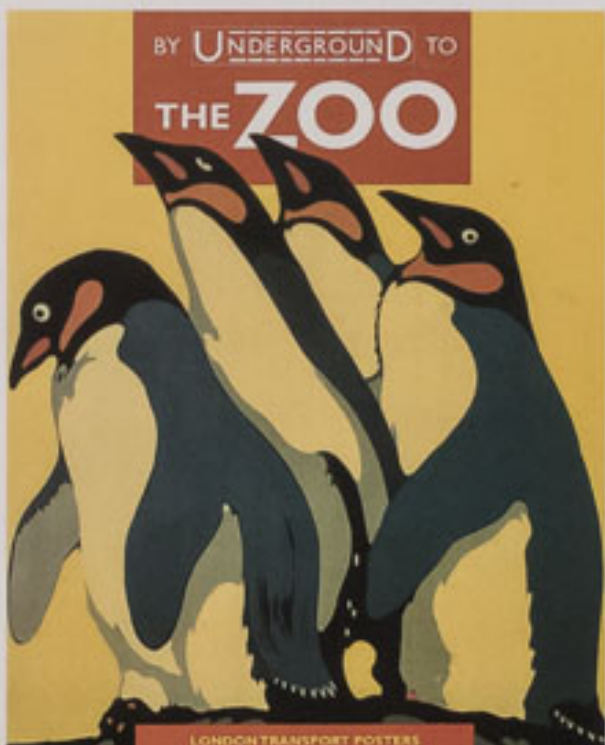
Jointly with BIOSIS, Volume 131 of the Zoological Record was published during the year, now available on line and by CD-Rom. Work on Volume 132 began in June and was set at 72,000 items.

Planning proceeded with the new Fellowship Scheme. Priority was given to developing the ZSL's database and a new software package was commissioned. 75% of Fellows now renew their subscription by Direct Debit and a very positive response to the launch of a covenanting scheme has raised over £17,000 for the ZSL. Over 93% of Associates transferred on preferential terms to the Fellowship.

Three editions of the Newsletter were published. They each contained

the usual blend of constitutional issues, programme of meetings, features on animals and elections to Council. The newsletter is edited, compiled and despatched entirely by voluntary labour.

'By Underground to the Zoo', a definitive history of London Transport posters featuring London Zoo was published by London Transport in August. Written jointly by the LT Museum's Assistant Curator of Ephemera and the ZSL Clerk to the Council, Peter Denton, the book resulted in a large exhibition featuring the Zoo being mounted at the LT Museum and a range of merchandise, much of it also available in the London Zoo shop.



LONDON TRANSPORT POSTERS, ILLUSTRATIONS IN 'BY UNDERGROUND TO THE ZOO'



CONSERVATION AND CONSULTANCY DIVISION

The overseas consultancy and conservation projects of the ZSL are managed through a division established in 1992. The turnover in 1995 was £1.2 million. The operations generate a surplus of £3K. The division secures 90% of its income through commercial contracts and raises charitable donations and grants for the remainder. The division is operating in eight countries with a total of 37 full-time staff overseas.

Senior Executive: Alexandra Dixon (Director of Conservation and Consultancy Division).

The division was created to serve as a conduit through which the skills and resources of the ZSL could be applied directly to practical conservation projects in the field. This remains its principal function but the types of activities undertaken have expanded to include consultancies whereby the division can earn further income. All projects and overheads are externally funded through corporate aid agency and foreign government sources; however, a significant proportion are joint-funded and thus need matching funds to be generated by the division. The division is required to secure an operational surplus which includes the full costs of implementing and administering its activities.

The majority of the division's work and turnover is generated by the King Khalid Wildlife Research Centre in Saudi Arabia. This project, undertaken on behalf of the National Commission for Wildlife Conservation and Development, Saudi Arabia, started in 1987 when we were asked to manage the Centre for the purposes of gazelle conservation and research. Initial priorities to establish proper husbandry regimes and to eliminate tuberculosis have now given way to re-introduction of healthy viable populations of gazelles back into the wild. Over 80 mountain gazelles and 250 sand gazelles are now found roaming free once more in their natural environments where previously they had been exterminated through competition with domestic stock and overhunting.

Other donors and sources of income have been the Overseas Development Administration, Land Rover and Suzuki Cars.



A NEWLY BORN SAND GAZELLE



AN ELEPHANT ANAESTHETIZED TO REMOVE SPEAR

Diversification of income stream is the priority commercial objective for the division in 1996. At the moment, the grant income it receives for matching funds projects, or donations of equipment to field projects, are partially funded from the operating costs of the division. The objective now is to move towards securing dedicated funds for these operations, so releasing management fees from contracts to be used for development of the ZSL's field activities.

The division has maintained a very low administrative base. Its office and UK administration costs are 9% of overall turnover. Only three UK-based staff are employed including the divisional director. This ratio will be maintained as business grows.



WILDLIFE VET DR RICHARD KOCK WITH HIGHLY ENDANGERED HIRCOLA IN KENYA

The attached summarized financial statements show the overall results of the Society for the nine-month period to 31 December 1995. During this period the Society achieved a surplus of £2,578,000 and increased its total funds to £14.6 million, an encouraging performance.

The Society changed its financial year-end to 31 December to correspond more appropriately with its operating cycle, and accordingly the results are for a nine-month period as compared to the twelve-month period of the comparative figures. The results therefore benefit from the omission of the winter months January to March when attendances at London Zoo and Whipsnade are at their lowest. Results for the calendar year 1995 before exceptional items would have shown a surplus of approximately £200,000.

The period benefits from the receipt of £1 million from the estate of John Perry, and further amounts of up to £1 million are expected shortly. This money will be held centrally and 'lent' to the operating divisions for capital projects. In addition, income for the period included £317,000 representing the Library Fund which was reclassified from liabilities.

Both London Zoo and Whipsnade recorded operating surpluses for the period after charging depreciation.

Whipsnade's result was particularly impressive with a surplus of £717,000 achieved through increased visitor numbers, income generation and tight cost control. Both London and Whipsnade showed increases in visitor numbers on an annualized basis, London Zoo from 958,000 to 984,000, Whipsnade from 391,000 to 423,000. The Institute of Zoology again showed a satisfactory surplus, Conservation and Consultancy did slightly better than break even while the Learned Society showed a small deficit, due to the exclusion of the peak spring publication income.

Capital expenditure in the period was £914,000, a significantly lower figure than in the previous year which included the construction of the Ambika Paul Children's Zoo at Regent's Park. A large number of projects were undertaken during the year of which the most significant was the re-wiring of the Regent's Park aquarium. The Society has generated sufficient cash during the period to fund its capital expenditure.

The Society is still in the process of finalizing the lease for the Regent's Park site with the Department of National Heritage. The requirement to bring all the property to a full state of repair over a 10-year period represents a major challenge to the Society and we are currently undertaking a survey to enable us to set targets and monitor progress over the period. The other main financial challenge is to raise the £2.2 million to match the funds provided from the National Lottery for the new Conservation and Education building.

The Society is becoming increasingly confident of the soundness of its finances for the future. Central funds have been substantially increased, financial controls have been tightened and sufficient funds are being generated to undertake a modest capital programme. However, it remains dependent on its donors and supporters to enable it to achieve the substantial refurbishment required at both Regent's Park and Whipsnade and their continuing support is gratefully acknowledged. The Society receives no government funding other than scientific research grants. It is, however, liable for VAT on its activities, unlike most European zoological societies, and therefore the Society fully supports the initiatives to harmonize with European legislation providing exemption from VAT.

HARRY WILKINSON
TREASURER

**Consolidated Statement
of Financial Activities
for the 9 months ended
31 December 1995**

	9 MONTHS TO 31.12.95 £000	12 MONTHS TO 31.03.95 £000
OPERATING INCOME		
VISITOR ADMISSIONS	5,652	6,114
CATERING AND SHOPS	2,750	2,830
LESS: COST OF GOODS SOLD	(972)	(1,012)
	1,778	1,818
OTHER ZOO OPERATING INCOME	601	705
GOVERNMENT AND OTHER GRANTS	1,720	2,633
SALES AND FEES	272	558
SUBSCRIPTIONS	112	146
DONATIONS AND OTHER INCOME	720	541
TOTAL OPERATING INCOME	10,855	12,515
OPERATING EXPENDITURE		
STAFF COSTS	5,305	6,760
ANIMAL FOODSTUFFS	281	332
REPAIRS AND MAINTENANCE	336	371
DEPRECIATION	630	918
RELEASE OF CAPITAL GRANT	(9)	-
UTILITIES AND OTHER OVERHEADS	1,599	2,661
PUBLICITY AND ADVERTISING	1,156	1,440
ADMINISTRATION	915	898
TOTAL OPERATING EXPENDITURE	10,213	13,380
OPERATING SURPLUS / (DEFICIT) FOR THE PERIOD	642	(865)
INCOME FROM INVESTMENTS	112	167
INTEREST RECEIVABLE	299	262
CONSEQUENTIAL LOSS CLAIM	-	93
	411	522
SURPLUS / (DEFICIT) FOR THE PERIOD BEFORE EXCEPTIONAL ITEMS	1,053	(343)
EXCEPTIONAL ITEMS		
CAPITAL AND MAJOR DONATIONS	1,051	1,076
INSURANCE CLAIM PROCEEDS	-	740
SURPLUS ON SALE OF ASSETS	29	40
TRANSFER FROM DEFERRED LIABILITIES	317	-
UNREALIZED GAIN / (LOSS) ON MARKET VALUE OF INVESTMENTS	128	(131)
	1,525	1,725
SURPLUS FOR THE PERIOD	2,578	1,382
TOTAL FUNDS BALANCE BROUGHT FORWARD	12,023	10,641
TOTAL FUNDS BALANCE CARRIED FORWARD	14,601	12,023

**Cash Flow Statement
for the 9 months ended
31 December 1995**

	9 MONTHS TO 31.12.95 £000	12 MONTHS TO 31.03.95 £000
SURPLUS / (DEFICIT) FROM OPERATIONS	1,053	(343)
EXCEPTIONAL ITEMS	1,525	1,725
SURPLUS FOR THE PERIOD	2,578	1,382
ADD BACK DEPRECIATION	630	918
	3,208	2,300
LESS PURCHASE OF FIXED ASSETS (NET)	(895)	(2,903)
	2,313	(603)
CHANGES IN OTHER ASSETS AND LIABILITIES	(694)	669
NET CASH INFLOW / (OUTFLOW)	1,619	(66)

**Revenue Account by
Division for the 9 months
ended 31 December 1995**

	9 MONTHS TO 31.12.95 SURPLUS/ (DEFICIT) £000	12 MONTHS TO 31.03.95 SURPLUS/ (DEFICIT) £000
DIVISIONS:		
ZOOLOGICAL GARDENS	295	319
LONDON ZOO	717	951
WHIPSHADE PARK	<u>1,012</u>	<u>1,270</u>
SCIENTIFIC:		
INSTITUTE OF ZOOLOGY	46	62
CONSERVATION AND CONSULTANCY	3	3
LEARNED SOCIETY	(22)	52
	<u>27</u>	<u>117</u>
ENDOWMENT FUNDS	48	(62)
OTHER DESIGNATED FUNDS	1,556	4
ZSL DEVELOPMENT TRUST	(65)	53
	<u>1,539</u>	<u>(5)</u>
SURPLUS FOR THE PERIOD	<u>2,578</u>	<u>1,382</u>

**Consolidated Balance Sheet
at 31 December 1995**

	31.12.95 £000	31.03.95 £000
FIXED ASSETS		
TANGIBLE ASSETS	7,486	7,202
INVESTMENTS	1,772	1,630
	<u>9,258</u>	<u>8,832</u>
CURRENT ASSETS		
STOCK	368	386
DEBTORS	941	1,105
CASH AT BANK AND IN HAND	6,160	4,541
	<u>7,469</u>	<u>6,032</u>
CREDITORS: AMOUNTS FALLING DUE WITHIN ONE YEAR	(1,825)	(2,571)
NET CURRENT ASSETS	5,644	3,461
DEFERRED LIABILITIES:		
ACCOUNTS FALLING DUE AFTER MORE THAN ONE YEAR	(301)	(270)
	<u>5,343</u>	<u>3,191</u>
NET ASSETS	<u>14,601</u>	<u>12,023</u>
FUNDS		
GENERAL	10,651	9,688
ENDOWMENT	489	441
OTHER DESIGNATED	3,461	1,313
ZSL DEVELOPMENT TRUST	-	581
TOTAL FUNDS	<u>14,601</u>	<u>12,023</u>

COVER IMAGE

SOUTH AMERICAN BUTTERFLY, *HELICONIUS CHARITONIUS*
RADIOGRAPH OF A GOLDEN LION TAMARIN
PERSIAN LEOPARD'S SPOTS

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WHIPSHADE WILD ANIMAL PARK: 01582 872171
THE INSTITUTE OF ZOOLOGY: 0171 449 6601
CONSERVATION AND CONSULTANCY DIVISION: 0171 449 6204
ZSL DIRECTOR OF FINANCE: NORMAN REED 0171 449 6211
ZSL DIRECTOR OF PERSONNEL: IAN MEYRICK 0171 449 6250

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