



CHESTER



1998 ZOO REVIEW

Annual Report of the North of England Zoological Society

nineteen ninety eight

To support and promote conservation by breeding threatened animals,
by excellent animal welfare, high quality public service,
recreation, education and science

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AFFILIATIONS



Chester Zoo's support for CBSG – the Conservation Breeding Specialist Group of the World Conservation Union (IUCN) – has helped to facilitate many important wildlife projects this year, including:



Conservation
Breeding
Specialist
Group
IUCN Species
Survival
Commission

Population and Habitat Viability Assessment (PHVA) workshops

Humboldt's Penguin in Chile
Peary's Caribou in Canada
Mapleleaf Mussel in Minnesota, USA
Iberian Lynx in Spain

Conservation Assessment and Management Plan (CAMP) workshops

Orchids in Costa Rica
Sealions and relatives in Mexico

AWARDS

Some of the eleven national, regional and local awards won by the Society in 1998



Record achievements and awards

A wonderful year of record achievements, awards and revenue, and a twenty year high visitor level! There have been so many notable events that there is simply not space for them all here. The Divisional Reports (pp 12 - 19) give greater detail.

Twilight Zone

Faith in the concept of this innovative nocturnal exhibit has been more than repaid. It became a prime visitor experience from mid year onwards. The added value of the walk-through with integral interpretation, staff presenters and soft landscaping have given us a world class exhibit. The bats have already begun to breed. Douglas Adams, writer and conservation campaigner, assisted by his three year old daughter Polly, unveiled the commemorative plaque after an entertaining talk to a packed house in the lecture theatre on 12th September.



Gold Medallist

Sir David Attenborough, with his daughter Susan, enchanted members, staff and guests during his visit on 22nd May 1998. They toured the zoo, meeting baby elephant *Sithami* and black rhino calf *Kitani* with a lemur feed as a finale. A full house in the lecture theatre marvelled at Sir David's presentation of clips from years of wildlife photography. Chairman Beatrice Jones read the citation, and the President, His Grace The Duke of Westminster, presented the *Gold Medal of the Society*. The full citation was published in the Summer edition of *Chester Zoo Life*.



Special evening

Our first *Disability Awareness Evening* in August attracted almost 5,000 guests and we will now plan to make this a regular event. We owe considerable thanks to Volunteer Co-ordinator Mike Elkerton.

Magic Million in December

We passed the *all visitor attendance* million on 5th December, with Junior Member, Simon Davies – a twenty year high in our visitor numbers and financial results. Encouraging, we stayed 'in the black' until the end of the year.

Outstanding breeding success

Baby elephant *Sithami* has made excellent progress through the year, with *Thi* an attentive mother. Her half sisters *Tara* and *Karishma* were born at Twycross Zoo in August. Black rhinoceros *Esther* is rearing *Manyara*, and there was a double event with inseparable Sumatran Orang utans, *Subis* and *Emma* having fine youngsters to *Puluh*. It is ten years since Sumatran Orang utans were born here. The fourth litter of Asiatic Lion cubs were born in October. The Andean Condors parent reared their chick – a UK 'first'.

Spirit of the Jaguar!

The grand finale for 1998 was the news that *Jaguar Cars* have agreed a \$3,000,000 (£1,800,000) sponsorship programme with us to create a world class Jaguar facility in the Zoo and an *in situ* conservation programme in Central America. We are immensely grateful for this generosity, and for the dedication of our Fundraising Advisory Board, Development Manager John Regan and supporting staff.



'Always building'

The dynamic construction programme through the year included extensive re-roofing and upgrading work at the *Tropical Realm* after year end gale damage, and impressive progress on the new elephant bull facility. The giraffe house and main rhino house have had new roofs, and there was a total rebuild of the satellite rhino facility. The 'time expired' *Small Mammal House* has gone and a new lawn gives wide panoramas at the entrance. The long promised demolition of the *Small Cat House* has been substantially completed.



**President**

His Grace, The Duke of Westminster OBE, TD, DL
The 6th Duke continues the long standing tradition of Grosvenor family support for the Society.

**Vice President**

The Right Honourable, The Viscount Leverhulme KG
Taking up the post from the end of the year, our incoming Vice President renews the historic connection between the Zoo and the Lever family.

Vice President, Dinah, Lady Tollemache died in January 1998

Vice President, Professor Emeritus Oliver King retired in October 1998

COUNCIL

Chairman
Keith Maybury
MA, DM, FRCS
Consultant surgeon in Greater Manchester.



Karen Davies BDS, MPH
Dental practitioner. Local Upton resident. Elected 1998.



Derek Lyon BVSc, MRCVS
Veterinary surgeon. Administrative Director British Veterinary Zoological Society. Elected 1998.



Graham Pollard BSc, LLB, MA, CBiol, MIBiol
Biologist and Environmental lawyer.



Vice Chairman
Brian Coles BVSc, MRCVS, DipECAMS
Consultant avian veterinary surgeon, lecturer, author, govt wildlife inspector.



Jean Dixon CChem, FRSC
Retired Research Chemist. Wildlife photographer.



Brian Livingstone MB, ChB, FRCS
Consultant orthopaedic surgeon in Leigh and Wigan.



Alan Sharples BA, IPFA, IRRV
Financial Controller with major Hospital Trust in Merseyside. Local Upton resident. Elected 1998.



John Brown
Public Affairs Manager with major international petrochemical company.



Kathryn Edwards BSc
Manager with leading London merchant bank. Active Junior Members' Club supporter.



Chris Mahon MSc
Director and Head of Conservation. The Cheshire Wildlife Trust.



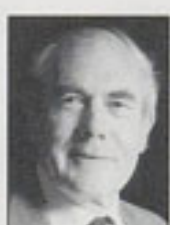
Tony Williams
Assistant General Manager with a major Chester-based bank. Re-elected 1998.



Dr David Cooke FRCGP, FRPS
Retired General Practitioner in Ellesmere Port. Wildlife photographer. Advisor, GB and England swimming teams.



Professor Brian Gardiner BSc, PhD, DSc, PLS
Professor of Zoology at King's College, University of London. President of the Linnean Society of London.



John Makinson TD, MA
Retired solicitor from Chester and a long term supporter of the Society.

**COUNCIL COMMITTEES****Finance Committee***

Recommends financial policy, including pricing, revenue and capital budgets, long term forecasts, long and short term borrowing and lending and allocation of surpluses. Meets the Auditors at least annually to discuss their findings.

Alan Sharples (Chairman)	John Makinson
Keith Maybury	Tony Williams
Prof Gordon McGregor Reid (Director)	Michael Johnson (Staff)
Alan Sykes (Staff)	Chris Vere (Staff)
Chris West (Staff)	

Programmes and Membership Committee*

Responsible for talks and events for members and the general public, within the general remit of enhancing the Society's status as a forum for communication and debate on conservational and biological topics. Advises on membership policy.

Kathryn Edwards (Chairman)	Karen Davies
Jean Dixon	Graham Pollard
Maria Warrington (Member)	Prof Gordon McGregor Reid (Director)
Stephen McKeown (Staff)	John Regan (Staff)
Chris Vere (Staff)	Alan Woodward (Staff)
Maureen Allsopp (Secretary)	

Pension Fund

Manages the superannuation fund scheme, and authorises payments in accordance with its deed and Council instructions. Advises on Pension policy.

Trustees

Jean Dixon	Alan Du Cros
John Makinson	Tony Williams
Michael Johnson (Staff)	Alan Sykes (Staff)

Advisors Bill Bowman - Wm. M Mercer Ltd
Nigel Coles - Nikko Capital Management (UK) Ltd

Scientific and Veterinary Committee*

Advises on exhibition and conservation policy and on scientific and Health and Safety matters. Monitors animal husbandry, welfare and veterinary care.

Members

Brian Livingstones (Chairman)
Dr John Charles-Jones
Brian Cole
Dr David Cooke
Brian Edwards
Derek Lyon
Dr Spenser Madden
Chris Mahon
Keith Maybury
Pat Wisniewski

Staff

Prof Gordon McGregor Reid (Director)
Michael Crumpler
Donald Dinning
Nicholas Ellerton
Mark Pilgrim
Mark Sparrow
Neil Spooner
Chris West
Dr Roger Wilkinson
Karen King-Sharp (Secretary)

Consultant Noel Walker (Gatehouse Veterinary Hospital)

Remuneration Committee*

Determines remuneration and conditions of service for the Director and Heads of Divisions.

Keith Maybury (Chairman) Alan Sharples

Zoo Estates Panel

Liaises between the Society, its Land and Property Agents and tenants.

Society

Prof Gordon McGregor Reid
Michael Johnson
Stephen O'Brien

Denton Clark & Co.

Michael Scott
Julian Mellis

* Sub committees of Council.



We are pleased to report on a particularly successful year, despite the wettest high season on record, and many other attractions experiencing a downfall in visitors. With the 'under threes', we had well over one million guests – our highest attendance for over 20 years. This created an increased income to support our charitable activities of almost £8.9 million – more than double that of 1992 – and eliminated our bank overdraft of over £900,000. This, in turn, released more than £1 million of expenditure to construct and maintain even better homes for our animals, to

promote conservation, education and science and to greatly improve visitor and staff facilities.

Close teamwork helped us cope with some of the worst weather that could be thrown at us. Gale force storms early in winter caused much damage around the Zoo followed by heavy snow in Easter which collapsed several of our large free-flight aviaries with the sad loss of several birds. Everyone worked quickly together to repair the damage, clear the snow and open the gates.

With the biggest 'baby boom' of this decade, the animals provided us with some wonderful crowd pullers. The year started with the excellent news that our elephant *Thi* was rearing her calf *Sithami*, born on New Year's Eve, 1997. This high profile baby has developed well and continues to charm the crowds. Good news came from Twycross in the summer that *Sithami* had two half sisters (sired at Chester by *Chang*) and both were being parent-reared. *Manyara*, a Black Rhino born to *Esther* in August, is growing well. With the move of our Indian Rhino to Berlin, we now have more space to concentrate on this vital breeding programme. Other notable, rare babies include: two Sumatran Orang utans (the first in eleven years and both parent reared by mothers who, themselves, had been hand-reared); *Bentley* (the first male giraffe to be born in the Zoo for eighteen years); a parent-reared Condor (the first ever at Chester and, we believe, in the UK); and a baby Bongo, two camels and three Asiatic lion cubs. We also received a commendation from the Universities Federation for Animal Welfare (UFAW) for husbandry improvements in building the new *Condor Cliffs* exhibit.

Strategic planning by Council and staff for the improvement of the Zoo has come to the fore, with many exciting new ideas being generated for the years to come. These ideas are summarised in *2020 Vision* – a landmark document giving the position in 1998 and plotting out development targets for the next two decades. A five year capital expenditure plan to take us to the year 2002 was also produced which, although clearly subject to annual revision, immediately helps steer a better financial course.

The few remaining substandard buildings in the Zoo were demolished this year. The removal of the Small Mammal House opens up a green vista at the entrance, part of which will be incorporated in an extension to the proposed *National Elephant Centre*. The dilapidated Bird House has been dismantled and the new *Islands in Danger* project will take its place in 1999. Finally, demolition of the old Cat House opens up the congested area next to the new *Monkey Islands*.

A major exhibit this year was the *Twilight Zone*, with its

free-flight bats – the largest and best cave-style facility anywhere. It was opened in September by distinguished writer and conservationist Douglas Adams and has proved a big success for the public and the bats alike. The Penguin Pool (*Rare Penguin Breeding Centre*) was redeveloped to a very high standard and to much public acclaim. However, technical problems with the sophisticated new filtration system caused us to reschedule the official opening to 1999.

Staff training and development is ever more important, and 1998 saw the progression of the job relativities project and a work structuring programme (which started in the Animal Division) that is taking a fresh look at how the Zoo can be better organised. Four more keepers gained the Zoo Animal Management Certificate and seven gardeners passed NVQ level II Amenity Horticulture. Several new positions have been filled this year including three new teachers in Education, an IT Supervisor to co-ordinate the Zoo's computer needs and a CAD (Computer Aided Design) Engineer for the Estates Division to assist in planning projects.

New developments in the Education Division included summer activities for children which proved extremely popular and the innovative *Dinosaur Experience* and *Sex Education* programmes. High quality interpretation around the Zoo continues to grow and our own educational CD-ROM was developed for a launch in 1999. The usual wide range of zoo, wildlife and conservation related meetings were hosted, including the *Annual Meeting of the UK Federation of Zoos* in May. This attracted over 80 delegates from many collections throughout Britain and Ireland.

There was a special day in May where our President His Grace The Duke of Westminster presented the *Gold Medal of the Society* to Sir David Attenborough, for outstanding lifetime achievements in the field of zoology. There were also special events to honour the excellent contribution of Beatrice Jones (above), who stepped down as Chairman after nine years in office and twelve years on Council.



We sadly note the death in 1998 of Vice President, Dinah Lady Tollemache, she was an outstanding supporter of the Society. We are also sorry to report the retirement of our other Vice President, Professor Oliver King after more than thirty six years of commitment to the Society for which we warmly thank him.

Wonderful news came from our Development Office just before Christmas of the extraordinarily generous offer from the Jaguar Car Company of a magnificent £1.8 million sponsorship for a multi-faceted Central American *Spirit of the Jaguar* exhibit and a field conservation initiative. This exhibit will open in spring 2001 to coincide with the launch of a new model of Jaguar car.

Overall it has been a superb year, capped by a clutch of eleven awards in the fields of animal welfare, marketing, tourism, the environment and business. For 1999 we were again voted *Zoo of the Year* by the The Good Guide to Britain.

Chairman
Keith Maybury

Director
Professor Gordon McGregor Reid

FUNCTIONS	OBJECTIVES	HIGHLIGHTS
<p>ANIMALS</p> <p>To manage, care for, and exhibit the Society's animal holdings to the highest possible standards for the purposes of conservation, education and benign scientific study.</p> <p>To increase our knowledge of the animals within the collection.</p> <p>To work closely with like-minded bodies in programmes of wildlife conservation and education at home and abroad.</p>	<ul style="list-style-type: none"> ■ To improve the management, good husbandry, planning, development and welfare of the Zoo's collection. ■ Select the best species balance to support the conservational, educational and scientific objectives of the Society, and balance these with reasonable public expectations. ■ Play an active role in supporting national and international zoo and wildlife programmes in conservation and science. 	<ul style="list-style-type: none"> ■ Successful births and parent rearing of: Asiatic Elephants - Chester and Twycross Black Rhinoceros Sumatran Orang utans Andean Condor. ■ Completion and opening of <i>Twilight Zone</i> bat cave by Douglas Adams. ■ Completion of <i>Rare Penguin Breeding Centre</i> project providing greatly improved conditions for the birds. ■ Strengthened veterinary and research programmes. ■ Director and Chief Curator become visiting members of the Veterinary Faculty, University of Liverpool.
<p>EDUCATION</p> <p>To explain the collection for visitors by provision of appropriate signage, presenters and other means. To provide education services and materials for schools, colleges, universities and other interest groups. To support education outreach programmes at home and abroad. To organise resources to meet these aims, including the volunteer programme.</p>	<ul style="list-style-type: none"> ■ Increase knowledge, awareness and empathy for animals and their environment and the role and work of the Zoo for the general public, schools, colleges of higher education and professional educators at all levels. ■ Expand and enhance the Zoo's information, interpretation and library services. ■ Provide a worthwhile educational input in selected habitat countries to support conservation. 	<ul style="list-style-type: none"> ■ Successful launch of new primary teaching programme. ■ Appointment of three new teachers. ■ Appointment of new librarian with increased service hours. ■ Development and installation of interactive interpretation in <i>Twilight Zone</i> and at the <i>Rare Penguin Breeding Centre</i>. ■ Development and running of <i>Summer Activity</i> days for school children. ■ Running a joint MSc module on <i>Conservation Breeding and Animal Management</i> with Animal Division and Manchester Metropolitan University.
<p>ESTATES AND GARDENS</p> <p>To maintain and develop the fabric of the zoo. To upgrade existing facilities and support new concepts to improve the zoo environment. To ensure that the zoo's grounds are maintained to the highest standard for animals, visitors and employees and that the Society meets all the criteria laid down by legislation, including Health and Safety and environmental codes.</p>	<ul style="list-style-type: none"> ■ Efficient use of utilities. ■ Optimise use of buildings and environs. ■ Upgrade and refurbish the infrastructure. ■ Construct or organise new capital building projects to highest quality with maximum efficiency and economy. ■ Service requests for maintenance and the supply of materials. ■ Maintain and develop our services and public facilities to standards expected of a top leisure attraction. 	<ul style="list-style-type: none"> ■ Car parks and grounds coped with record number of visitors with extensive use of the overflow car parking facility. ■ A new, CD-Rom based, commentary was installed on the Overhead railway. ■ Eric Rudman, Head Gardener, retired after 32 years with the Zoo. ■ Ground work laid for the development of a new planned maintenance system. ■ Demolition of older sites: Small Mammal, Cat and Temperate Bird Houses. ■ Successful completion of the <i>Twilight Zone</i> bat cave exhibit.
<p>MARKETING</p> <p>To achieve visitor attendance targets through a mix of cost-effective advertising, promotional and public relations activities.</p> <p>To achieve trading targets through high quality catering and retailing operations.</p> <p>To further enhance the stature and public awareness of the Society through effective and appropriate communications.</p> <p>To provide appropriate high quality information services.</p>	<ul style="list-style-type: none"> ■ To be seen as UK's leading wildlife conservational and educational facility. ■ Maximise visitor based income through achievement of targets. ■ Increase visit frequency. Widen awareness to reach new visitors and encourage lapsed visitors to return. ■ Increased penetration in <i>Harlech</i>, <i>Central</i> and <i>Yorkshire</i> TV areas. ■ Extra income through major upgrade of catering facilities. 	<ul style="list-style-type: none"> ■ Excellent year for publicity, with successes in video news releases and record numbers of radio interviews/press cuttings (see p 9). ■ Highest print runs/increased pagination for <i>Chester Zoo Life</i> and <i>Chester Zoo News</i>, our promotional magazine. ■ Greater use of <i>Noah's Ark</i> float at regional outdoor events as an important field promotion tool. ■ Significant contributions to <i>Zoo Federation</i> promotions and first-ever <i>Association of Leading Visitor Attractions (ALVA)</i> promotion. ■ Highest ever Christmas function bookings in <i>Oakfield</i>. ■ Internet <i>Zoo Website</i> expanded, and uniquely includes the <i>Annual Report</i>.
<p>FINANCE AND ADMINISTRATION</p> <p>To provide financial control, accounting, personnel, office and security services. To manage visitor and staff entrance gates and stores. To help manage and develop the overall planning and budgeting process and support fund raising initiatives and development initiatives. Sustain growth in Membership and Adoptions.</p>	<ul style="list-style-type: none"> ■ Plan, budget and manage overall Zoo cash flow. ■ Provide timely financial information for Council and management. ■ Efficiently operate personnel, secretarial functions, offices, gates, stores, security and health and safety matters. ■ Advise on financial aspects of all zoo developments. ■ Administer the staff pension fund. ■ Secure external funding support. 	<ul style="list-style-type: none"> ■ <i>2020 Vision</i> Strategic Planning Document (final draft) published. ■ Budget strategy for 1999. ■ Progressed Job Relativities and Work Structuring processes. ■ Appointed IT Systems Supervisor. ■ Strengthened Wages Department and Security. ■ Zoos' VAT tribunal win, subject to appeal.

PERFORMANCE

- Outreach activity in Nigeria (Justin Bell), Namibia (Chris West), and South Africa (Prof Gordon Reid).
- Upgrading of several animal facilities in a new style of naturalistic presentation: 'back to nature'.
- Successful completion of City and Guilds Animal Management Course for four staff members.
- Restructuring of management responsibilities and strengthening of team.
- Universities Federation for Animal Welfare (UFAW) commendation for *Condor Cliffs*.

- Continued development of interpretation and presentation for the public.
- Over 8000 pupils and students taught by education staff between Easter and end of year.
- Development of the *Zoo Website* to include details of educational facilities for schools and colleges.
- Completion of substantial part of the library database.
- Over 10,000 hours of volunteer time donated to the zoo.
- Winner of the *Green Leaf Award* (second year running) for 'contributing to improvement of Cheshire's environmental performance' with our stand at the Cheshire Show.

- Record number of capital and maintenance works completed.
- Additional staff drafted into Estates Divisional office to meet growing capital programme.
- Zoo services and site details reformatted on to Computer Aided Design (CAD) software.
- Tree survey completed for Zoo Estate.
- Seven gardeners obtained Level II NVQ in Amenity Horticulture.
- Divisional Secretary Helen Smith won a 'student of the year' Silver Medal award for a national secretarial course and was second in the UK in the audio typing section.

- Summer publicity produced a twenty year high for visitors. All budgets exceeded, despite greater competition and indifferent weather.
- Planning for major upgrade of *Jubilee* catering has continued, with total refit of the in capital expenditure plans for 1999/2000. Oakfield beer garden paving relaid.
- New main A4 visitor leaflet, and three promotional adaptations have been most successful.
- Lead contributor in the *Chester Service Area Partnership* linking private/public sector to create a Tourist Information Centre on M 56.
- Independent research once again confirms our position as best value 'Family Day Out' in *British Tourist Authority* leading attractions list.
- Excellent year for external awards, including two Silver Medals from North West Tourist Board and *Zoo of the Year*.

- Another very successful financial year, exceeding all previous performances.
- No downturn because of *Blue Planet* Aquarium.
- No bank overdraft at the year end - a record.
- Installed a new electronic 'clocking on' system.
- Successful training programme initiated.
- *Chester Business of the Year* award from CEWTEC.
- Obtained substantial *Twilight Zone* bat cave sponsorship.
- Obtained a £1.8m sponsorship from Jaguar Cars Ltd.

DIRECTIONS FOR 1999

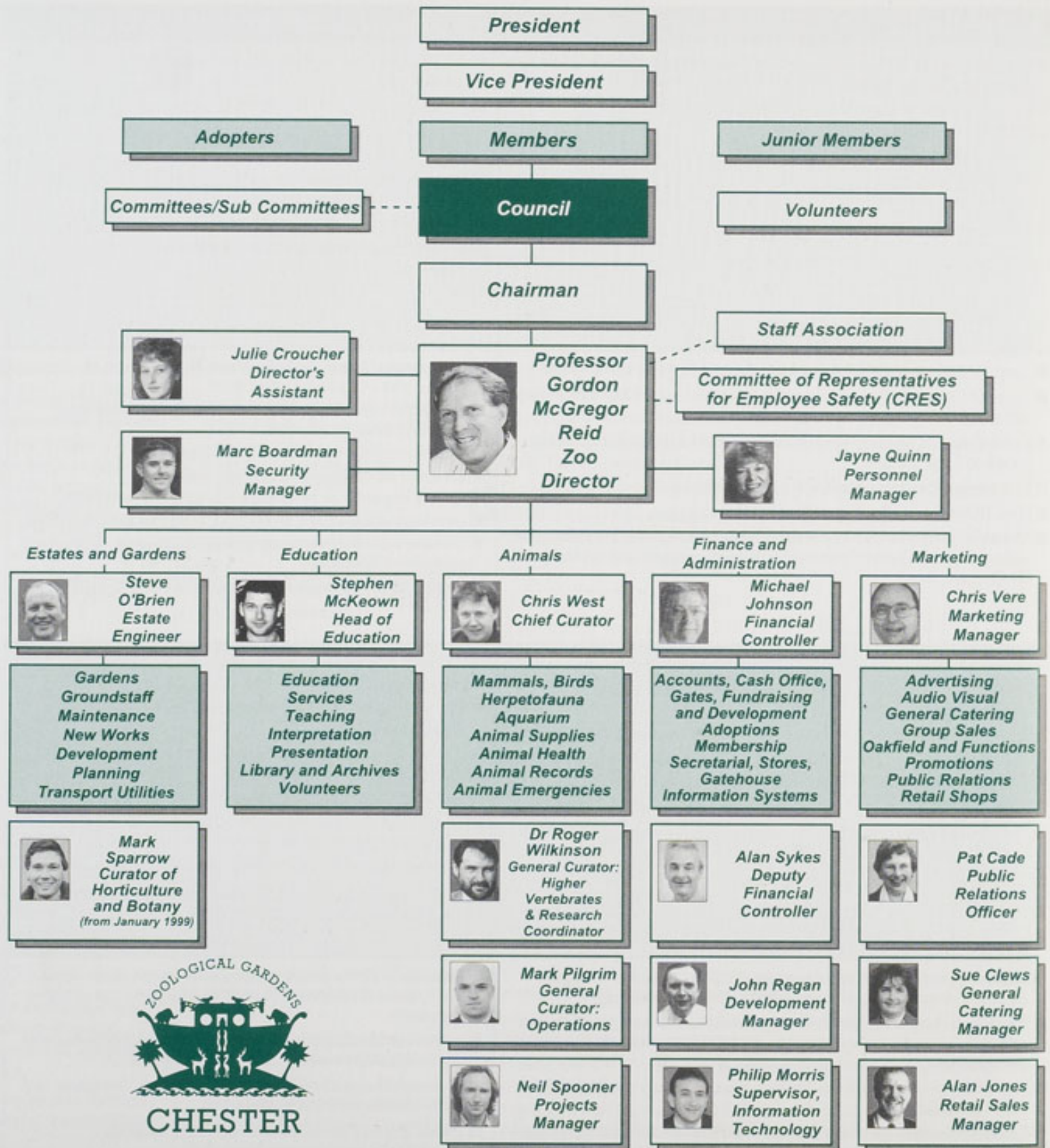
- Opening of *Islands in Danger* and *Bull Elephant Centre* extension.
- Co-development of Collection Plan and Physical Master Plan.
- Skilled project planning and teamwork for *Spirit of the Jaguar* and five other major developments.
- Develop Outreach programme especially in Philippines, Nigeria, Mexico and Central America.
- Forge even better links with university sector.
- Develop rapid response team for animal and other emergencies.

- Integrate new facility for *Wildlife Activities* area with *Let's Make Centre*.
- Building of *Animal Discovery Centre* and implementation of close-contact animal sessions.
- Complete interpretation for *Islands in Danger*.
- Complete interpretation and signage audit.
- Launch new teaching programmes for secondary age range.
- Develop and market new products for sale in the Education Shop.
- Increase use of the *Internet* for marketing education facilities and provision of information.
- Launch the new Zoo CD-ROM (in conjunction with Marketing Division).

- To complete another demanding and extensive capital programme.
- To implement the newly developed planned maintenance programme.
- A new Curator of Horticulture and Botany to develop Zoo gardens including *Roman Garden* as a Millennium project.
- Review status of existing building stock.
- To continue assisting with the development of the *Physical Masterplan* for completion in 1999.
- Overview and upgrading of Estate rented properties.
- Make representations to the City and County for the *Chester Local Plan* and *Cheshire Structure Plan*.

- Building on 1998 success, to sustain and support visitor levels, dwell time and enjoyment, through well-targeted, cost-effective campaigns.
- Jubilee refit and improvements, with associated soft landscaping and integrated provision of a children's play area.
- Planning the upgrade/integration of decorations, furnishings and facilities in the *Oakfield* building.
- Planning of enhanced Christmas activities, including illuminations.
- Major inputs into *2nd International Zoo Marketing Conference* in Amsterdam (WZO/EAZA).
- Appropriate Millennium celebration plan.

- Better capital expenditure co-ordination across Divisions.
- Implement results of Job Relativity and Work Structuring processes.
- Plan new office accommodation.
- Install new gate till system.
- Install new accounting system.
- Obtain successful result in VAT tribunal.
- Complete computer net-working throughout and IT masterplan.
- Install new Membership and Adoptions systems.
- Continue building on sponsorship successes.



FUNDRAISING ADVISORY BOARD



(Left to right) **Peter Foden**, President of ERF; **Geoffrey Piper**, Chief Executive of the NW Business Leadership Team; **Keith Maybury**, Chairman of NEZS; **Bill Landels**, Chief Executive of Manweb; **Donald Greenhalgh**, Chairman of Allen plc; **Alan Watson**, Formerly Regional Representative, The of Bank of England, Manchester Region; **Chris Clifford**, Director of the CBI North West; **John Conlan**, Chairman of Inward; **Neil Kemsley**, Regional Representative, The of Bank of England, Merseyside Region.

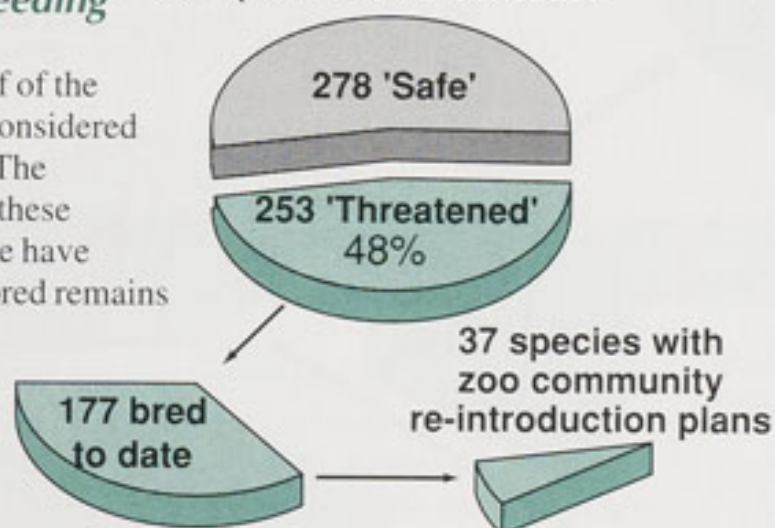
The first full year of the visitor performance 'benchmarking' research commissioned by the Association of Leading Visitor Attractions (ALVA) has been completed. Its results cover 32 'sites'. Whilst the full details of the results are confidential to ALVA members who took part, Chester Zoo has once again performed well against its natural 'peer group' in terms of *dwell time* (second longest of the members surveyed), *value for money* and *exceeding visitor expectations*. There will be three further waves of this research in 1999, giving us ongoing performance comparisons with leading attractions.

Our 1998 indicators cover key areas of achievement over our areas of operation*. We have added a *value for money* comparison with other top UK tourist sites.

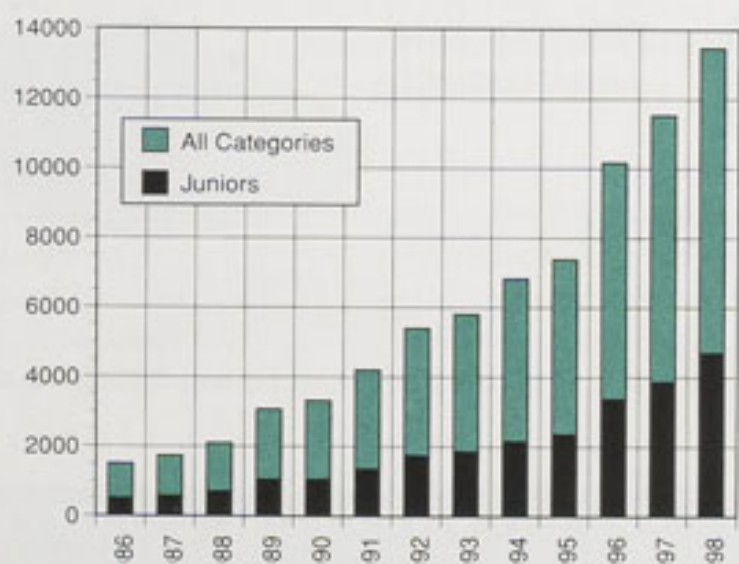
1. Threatened species: breeding

531 species in the collection

Just under half of the collection is considered 'threatened'. The proportion of these species that we have successfully bred remains similar to 1997.

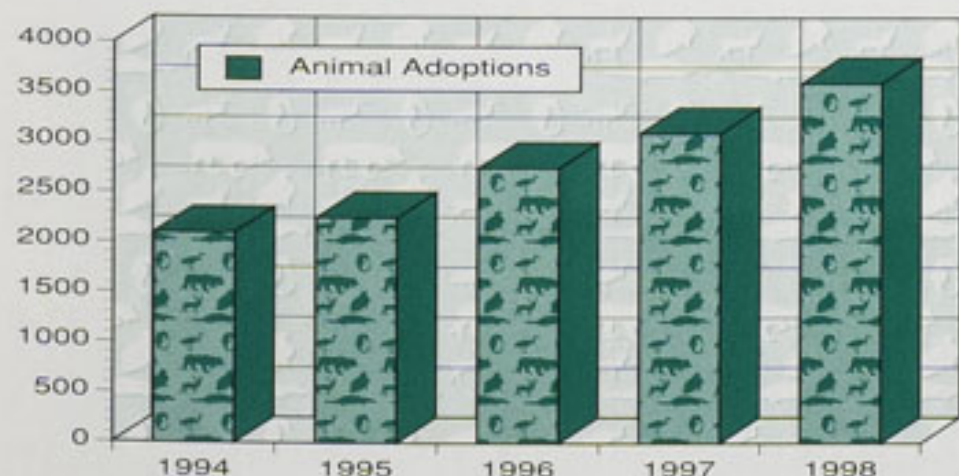


2. Membership growth



Total membership has continued the excellent upward trend, and now at 13,598 is our highest ever. There was an 14% growth in the year, on top of a 14% increase in the previous year. There has been a fourfold increase in the last ten years.

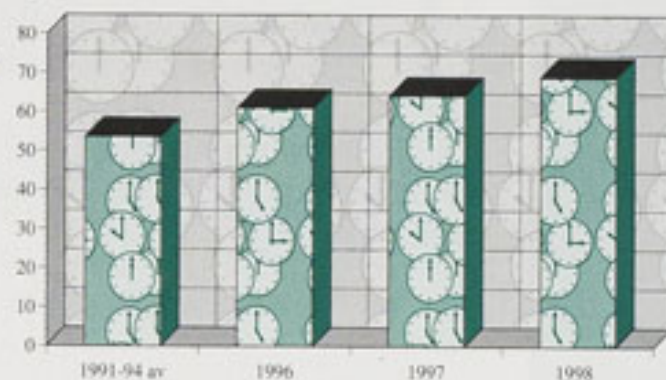
3. Animal Adoptions growth



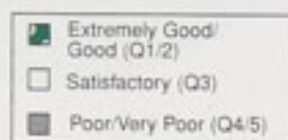
The number of individual adoptions has risen to a record 3,600, our highest to date. We are very grateful for this generous help to the Society.

4. Five Hour + High Season 'Dwell Time'

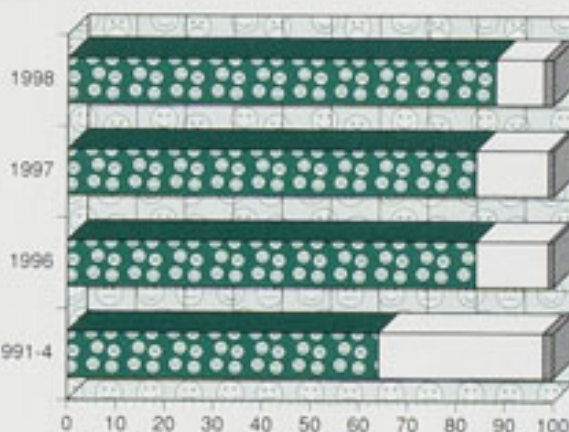
1998 data shows a further encouraging continuation of the trend of growing *dwell time* in the zoo. Over two-thirds of visitors (69%) now stay over five hours in the high season, compared with just over half (54%) for the 1991-4 average. The average time spent by visitors in the zoo in Summer is now 5 hours 15 minutes.



5. Ratings for 'Value for Money'

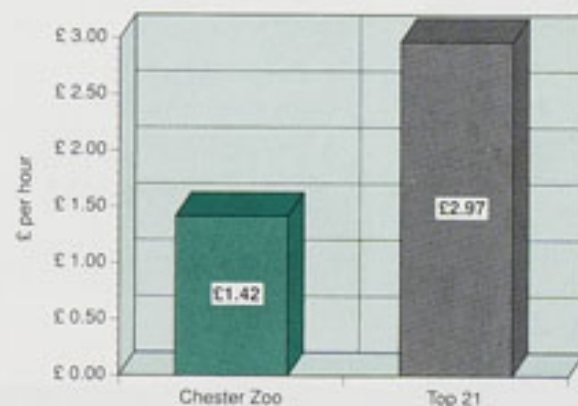


Visitor ratings for 'value for money' are one of the best guides to overall site performance. 1998 ratings for the highest quintile ('extremely good') and second highest ('good') are similar to 1996-7 data, showing that we have maintained standards. Over five out of six visitors (88%) gave ratings in the first or second quintile categories.



6. 'Value for Money' - comparisons with top UK tourist sites

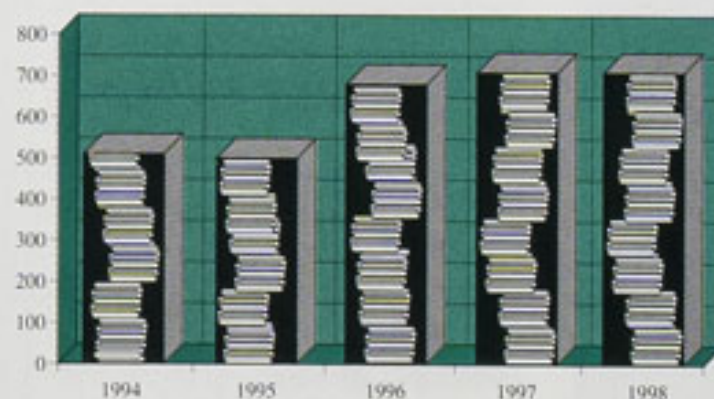
Independently conducted research showed that we were, yet again, the best *value for money* family attraction of the 21 top paid for tourist sites in the British Tourism Authority listing, and the second best value overall (to the Victoria & Albert Museum in London). The figures show that our cost per hour is less than half the average of the top 21 sites.



These calculations divide standard adult admission by peak season *dwell time*, to obtain a *cost per hour*. In 1997, we achieved similar results, being only fractionally behind The Royal Botanic Gardens, Kew.

7. Recorded Publicity - Press Cuttings**

Cuttings for 1998 continued at the 1997 high level reflecting significant media interest in our baby elephant, baby rhinos and the bats in the Twilight Zone.



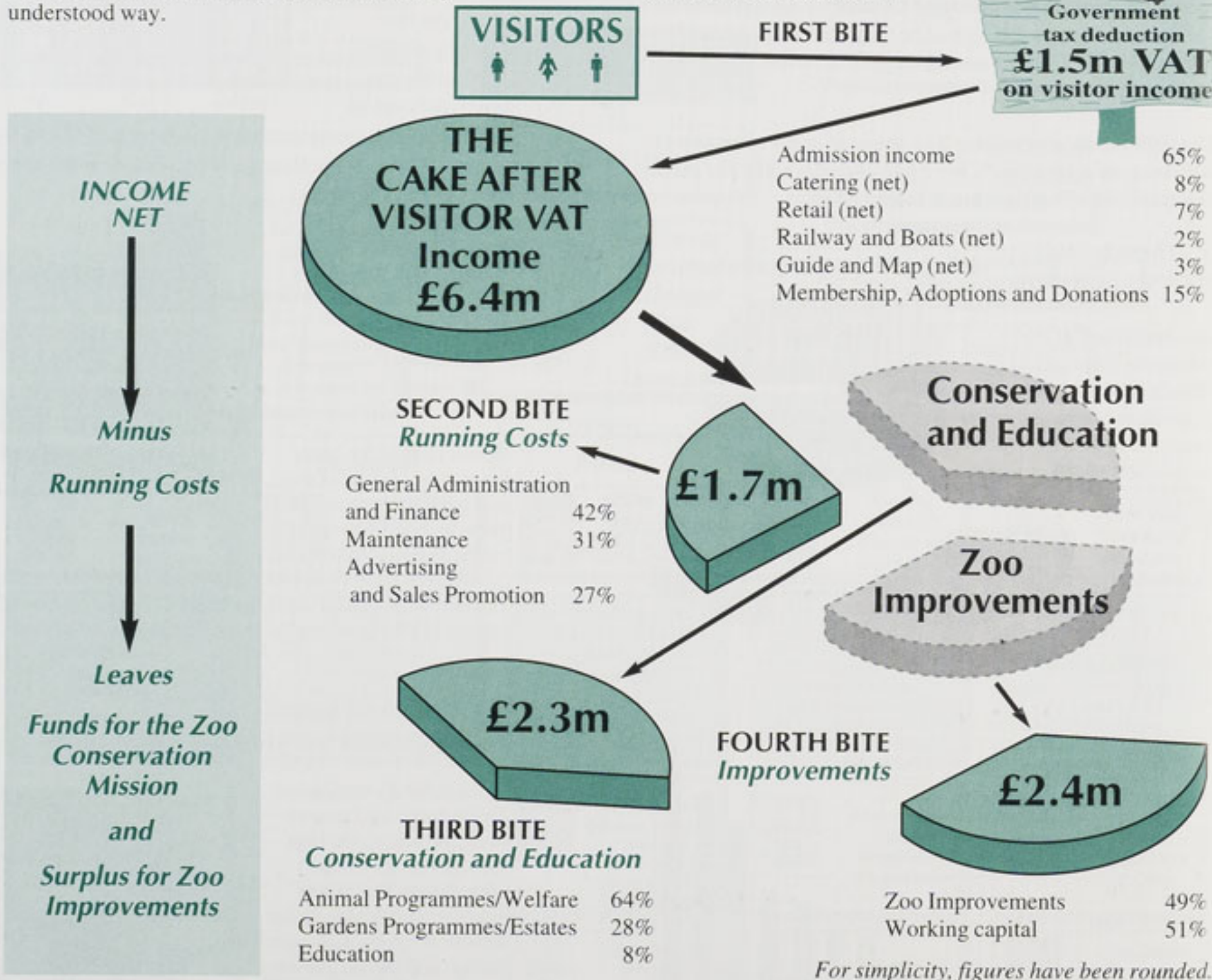
*Percentages are rounded throughout.

**Publicity figures are based on a simple count (unduplicated), and do not include technical/specialist material. There is no attempt to weight by readership or to assess space 'value'.

The Accounts, as presented on pages 22-27 are subject to detailed technical and legal requirements which may obscure understanding.

This informal presentation is designed to explain our financial situation in a simpler and more easily understood way.

We show below where our income comes from, and what is available for conservational expenditure and Zoo improvements after deducting running costs and tax (VAT). Zoo improvements provide better facilities for animals, visitors and staff.



ZOO VISITORS 1992-98

ANNUAL ZOO VISITORS

1998 visitor levels have *been the best for twenty years* and well above the figures in the period 1992-1995

Note: If under 3's are included in our visitor total, we estimate that it now adds 11%, taking it to *more than 1,019,000 for 1998.*



The Zoo continues to fully discharge its legal obligations for public safety and animal welfare under the *Zoo Licensing Act 1981* and the *Dangerous Wild Animals Act 1976*. The current Zoo Licence is valid to March 2001 following the interim inspection this year.

As members of the Federation of Zoological Gardens of Great Britain and Ireland we are also closely involved in discussions with members of the Government in the establishment of improved standards for Zoological Gardens across the European Union. Meetings on this have been held at Chester with a representative of the Department of the Environment, Transport and the Regions (DETR). The Director has also carried out inspections for the DETR in Britain and for the Hungarian authorities - the first inspection of an eastern European zoo to the new standards.

Further discussions and debates have continued with

Cheshire County Council and Chester City Council regarding the zoo's position in the *Cheshire Structure Plan* and the *Chester District Local Plan*.

The Cheshire Wildlife Trust has helped us with extensive survey work of the flora and fauna of the estate and with ideas for of a local bat survey being organised by the keepers and presenters in the *Twilight Zone* in conjunction with local bat conservation groups. We are grateful for their help.

We are becoming 'greener'. The sewage treatment plant is now even more efficient. For the future, we look forward to a major reed bed project, a full survey of our trees, and new naturalistic planting schemes by the newly appointed Curator of Botany and Horticulture, Mark Sparrow.

Professor Gordon McGregor Reid, Zoo Director

ZOO HEALTH AND SAFETY

The Society's commitment to the health, safety and welfare of its employees and those affected by its operations remains unaltered. To the best of its knowledge and belief, the Society meets the requirements of the *Health and Safety at Work Act 1974* and current subordinate legislation.

The major health and safety audit of 1998 was the interim inspection of the Society's premises done in accordance with the *Zoo Licensing Act 1981*. The inspection took place during February.

The *Management of Health and Safety at Work Regulations 1992* require employers to provide information, instruction and training for employees. To this end, various members of staff received competency training in the use of chainsaws, agricultural tractors and trailers. This training was provided

by the Engineering Department of Reaseheath College, Nantwich. In-house training resulted in candidates gaining competency in fork lift truck operation, the Intermediate Food Hygiene Certificate and the Basic Food Hygiene Certificate.

The Committee for Representatives of Employee Safety (CRES) was established and met regularly with the Director and Heads of Divisions to address safety matters.

The Cheshire St John Ambulance Brigade continue to assist the First Aid Team during the main season. During 1998, a total of 1280 requests for first aid assistance was dealt with. Of these, 942 were visitors and 338 were staff. Sixty six cases were referred to hospital for further treatment.

Donald Dinning, Safety Officer

ZOO PERSONNEL

The development of a dedicated personnel service continued in 1998, bringing the Zoo up to date with legislative and staff administration requirements. Contracts of Employment were redesigned and the provisions of the new European *Working Time Regulations* were incorporated into working practices and staffing arrangements.

As the Zoo continued to widen and expand its levels of operation, expertise in areas such as Information Technology and Horticulture and Botany were identified as important for future development. Major appointments for the Zoo in 1998 therefore, included an IT Systems Supervisor and a Curator of Horticulture and Botany. Both appointments were made from a large, highly experienced and professional field of applicants. The successful candidates were Phil Morris and Mark Sparrow, respectively.

A high level of seasonal staff turnover was a challenge in

1997, but in 1998 this was less evident. However, the Zoo was faced with increasing competition from surrounding retail and leisure developments in the Chester and Wirral areas, considerably reducing the pool of available applicants. Recruitment in catering proved especially difficult early in the year. This was a problem also experienced by other local organisations, as well as the Zoo.

Training in the Zoo's office computer software was completed in 1998. However, the development of a Computerised Personnel Information System (CPIS) was held over, pending the introduction of new electronic Time and Attendance and Payroll systems with which a CPIS should ideally interface. Other projects begun in 1997 and continued throughout 1998 included the Job Relativities Exercise chaired by an independent advisory body, the Advisory, Conciliation and Arbitration Service (ACAS); and the updating of the *Zoo Standing Procedures*.

Jayne Quinn, Personnel Manager

1998 has been another eventful and successful year. At the year end our total of threatened species was 253, equating to 48% of our total holdings.

This is demonstrated for by our continuing success with Asiatic Elephants, Orang utans (see below right), Black Rhinos, Asiatic Lions, Buffy-headed Capuchins and other mammals, Andean Condors (and too many other endangered bird species to list!), Lake Victoria Cichlids, Seahorses, Mexican Livebearers and other fish. We are developing our collection planning and management systems, increasingly building contacts with complementary academic research and conservation work in species' habit regions. A good example is how in 1998 we mixed our Rodrigues Fruit Bats and Seba's Short-tailed Bats in the world's largest free-flight, walk-through facility – the *Twilight Zone*. This has made a huge improvement to their physical fitness, physical and social environments and provides a unique experience to visitors. We also financially supported three research studies on behaviour and nutrition in Rodrigues Fruit Bats. Two of these involved field work on the Indo-Pacific island of Rodrigues and one was at Chester.

Major projects realised were the *Twilight Zone* and *Rare Penguin Breeding Centre* and also notable are the Giraffe House roof, *Tropical Realm* lean-to roof, Congo Peafowl Aviary, Rhino breeding building roof and Tuatara enclosure. From this our conservation performance is improved, and animal welfare and visitor experience standards are upgraded. During the year we said farewell to the Small Mammal House, the majority of the Small Cat House and the Temperate Bird House. All three buildings had become out of date. Agreement for their demolition was a part of an extremely successful Interim Zoo Inspection in which we received a very positive report.

Future projects to look forward to in 1999 and beyond include completion

of the Elephant Bull extension which will allow for safer housing of bulls in musth; a start on the extension of the existing elephant 'island' (with landscaping and replacement of the ditch with a safe ha-ha), an *Islands in Danger* exhibit in which we intend to house Komodo Dragons and Birds of Paradise (with other endangered island fauna and flora) and an *Egg Centre* for incubation, rearing and holding of young birds in a facility which will explain and educate.

We have started concept and design work on the *Spirit of the Jaguar* exhibit, improvements to our existing *Tropical Realm* (a joint Gardens and Animals project) and a series of conservation projects related to aquatic life including, ultimately, the development and replacement of the existing Aquarium. As part of a broader review of veterinary issues we are also looking at sealion and general hoofstock areas. Hence 1999 looks set to be even busier than 1998; and our recent work structuring changes in the Animal Division are designed to harness the talents and energies of all the staff.

One other exciting area of interest and development is considering how the Zoo – as a conservation organisation with firm environmental principles – can demonstrate high standards of energy and waste management and cost efficiency. A group of staff, the *Green Forum*, chaired by Paul Howse is exploring opportunities. Following a Biodiversity Audit of the Zoo and its estate carried out by the Cheshire Wildlife Trust with assistance from Zoo staff, ways of contributing to native species conservation and general awareness are also being developed.

I would like to thank Nicholas Ellerton and Keith Brown for their many years of service to the Society and wish them well for the future.

Chris West, Chief Curator

INTERNATIONAL COLLABORATION

Through 1998 the significant meetings and workshops included:

General

World Zoo Organisation (IUDZ) Annual Conference, Toyko, Japan. Professor Reid.

European Association of Zoos and Aquaria (EAZA) Annual Conference, Berlin. Professor Reid, Chris West, Dr Wilkinson.

Mock Zoo Inspection at the request of Budapest Zoo, Hungary. Professor Reid (with Dominique Tropeano, Director of Colchester Zoo).

European Association of Zoos and Aquaria (EAZA) Research Committee Meetings, Cologne, Germany. Professor Reid.

European Zoo and Wildlife Veterinarians Conference. (EZWV). Professor Reid.

Mammals

Elephant Management Workshop, Emmen, Holland. Nicholas Ellerton, Michael Jones, Neil Spooner.

AFRICAT, Namibia. Cheetah and Leopard Rescue and Rehabilitation centre visited by Chris West in advance of forthcoming members' trip (as part of a UK Zoo Directors and Senior Curators Study Tour).

Birds

International Parrot Convention, Tenerife, Canary Islands. Dr Wilkinson, Mark Pilgrim.

Reptiles

Komodo Dragon Conference, Thoiry, France. Isolde McGeorge, Darren Langford.

Fishes

WWF Biodiversity Planning Workshop, Capetown, South Africa. Professor Reid co-chaired Aquatic Group.

European Union of Aquarium Curators (EUAC) meeting, Barcelona Spain. Professor Reid, Mike Crumpler, Justin Bell.

EAZA/EUAC planning meeting, Amsterdam, Holland. Professor Reid.

Aquatic Conservation Conference and Workshop, University of Morelos, Mexico. Professor Reid (with Dr Heather Hall, London Zoo Aquarium).

Seahorse Management Workshop, Shedd Aquarium, Chicago, USA. Mike Crumpler.

Study Tour of major American Aquaria. Mike Crumpler, Justin Bell.

Private audience on ichthyology with HIM, The Emperor of Japan at the Linnean Society of London. Professor Reid and Professor Brian Gardiner (NEZS Council).

Our major fieldwork commitments were a follow-up survey of fish species conducted by Justin Bell in Gashaka Gumti Wildlife Park, Nigeria. This is part of a long term relationship of support of a unique area in Nigeria. Another follow up was part of Professor Reid's visit to Mexico when he and colleagues from the UK provided advice on care, exhibition and eventual reintroduction of livebearer fish. A wholly Chester Zoo funded field study is currently being carried out by John Pilgrim from Manchester Metropolitan University on the population and habitat status of Blue-eyed Cockatoos. This is a species which has a long history at Chester and Dr Wilkinson and Brian Livingstone (Member of NEZS Council and Chairman of Scientific and Veterinary Committee) deserve special mention for enabling this work.

Notable among many visits and communications from international collaborators were:

Dr William Oliver from Fauna and Flora International (FFI), based in the Philippines with whom we are supporting the Philippine Spotted Deer Project and developing plans to support Hornbill conservation work. The most exciting and certainly most novel, proposal is the 'adoption' of a small island off Luzon which has highly endangered, endemic fauna and flora and requires game-ranger input.

Richard Barnwell and others from World Wildlife Fund (WWF) UK came to discuss further plans for Gashaka Gumti involving fish and amphibian studies and further chimp studies (hopefully involving collaboration with Dr Barry Stevens-Woods' department at Manchester Metropolitan University).

Sally Walker from Zoo Outreach, India has agreed continued support and further funding for a Chiroptera conservation network in India with Dr Wilkinson.

Chris West, Chief Curator

This veterinary health review has been compiled from clinical case reports, laboratory findings and autopsy reports from 1998. There were regular veterinary performance audits via the Zoo's Scientific and Veterinary Committee which meets every three months. The Chief Curator is a veterinary surgeon, but the day-to-day veterinary work of the Society is contracted to the Gatehouse Veterinary Hospital, Lavister, Rossett, near Wrexham.

This year, Consultant Richard Ashworth became involved with the weekly routine and came in regularly when Noel Walker was unable attend. In the summer we had valuable help from Matthew Hartley, a newly qualified vet, who is enthusiastic about exotic animals.

Gail Mills now provides the necessary in-house support to run the zoo's veterinary laboratory. She is in daily contact with our main referring veterinary laboratory, Greendale, and has contact with other zoos and educational establishments wanting to share animal health and welfare knowledge with Chester Zoo. Other diagnostic and analytical services have been carried out by: the Veterinary Investigation Service, Ministry of Agriculture, Fisheries and Food (MAFF); Vauxhall Laboratories Limited (Norwich); Vet-Gen Europe (Winchester) and the International Zoo Veterinary Group.

Opportunities for practical training were provided for veterinary students from Britain and abroad. Much closer ties have been made with Liverpool University Veterinary School and in particular, Leahurst Veterinary Hospital. An exotic animal elective is now being pursued by several final year Liverpool vet students, which involves spending some 2-3 weeks at the Zoo. They are examined on their observations at the end of their course. Research links were strengthened, notably through joint meetings with Professor Jane Hurst and other members of the Veterinary faculty.



Parent rearing has proved very successful for the two second generation Sumatran Orang utans

Clinical Medicine

Sadly, elephant *Jangoli* gave birth to a still born calf. Under care, she took a full 24 hours to finally part with the 180 kg full term bull calf. This appears to be the largest recorded birthweight of any Asiatic elephant anywhere in the world. Fortunately, *Jangoli* has made a good recovery.

During the year the Veterinary Officer attended to:

Mammals	940
Birds	392
Reptiles	347
Total Case Load (including follow-up treatment)	1,679

Eighty nine cases required chemical restraint and/or general anaesthesia to perform clinical, radiographic and/or surgical procedures.

There were several major animal transactions involving transfers, importation, quarantine and/or export of various species including Californian Sealion, Black Rhinoceros, Indian Rhinoceros, Asiatic Elephant and Congo Peafowl.

Pathology

Notable post-mortems were for adult male Giraffe *Daley* (orthopaedic and cardiac problems); adult male Orang utan *Anak* (pulmonary, gastric and urinary infections); and three Arabian Gazelles (*Actinobacter* infections).

The summary statistics for post-mortem examinations 1st Jan - 31st Dec 1998 are :

Destroyed for humane reasons	39
Injuries/ accidents	67
Bacterial and fungal infections	99
Parasitic losses	12
Other	140
Total post-mortems	357

Disease organisms or parasites routinely encountered and treated included *Eschericia* spp., *Salmonella* spp., *Klebsiella* spp., *Pseudomonas* spp., *Yersinia* spp., and yeast or fungal infections, mainly *Aspergillus* spp.

The diagnosis and treatment of a copper deficiency in a Bongo cow was a notable therapeutic achievement. Colony management to an optimum group size of 30 is being achieved for our Chimpanzees by the controlled administration of the contraceptive pill.

A start to the computerisation of our veterinary records represents a significant step forward which will be progressed in 1999.

Noel Walker, Consultant Veterinary Surgeon
Gail Mills, Veterinary Laboratory Officer



Elephant *Sithami* began to take solid food before she was six months old

MAMMALS

1998 has been a year of change. The sub-standard Small Mammal House has gone and the old Cat House has mostly gone.

The Rodrigues Fruit Bats and Seba's Short-tailed Bats have more than benefited from their move to the *Twilight Zone* and so have our visitors. I feel that the *Twilight Zone* provides a very real experience for not only our guests, but many of our staff too. We know that this 'total immersion' exhibit has positively altered the perception of bats for many thousands of our visitors.

We ended 1997 with the birth of the Asiatic elephant *Sithami* and had high hopes for a second calf from *Jangoli* in April. After a prolonged labour she produced a male calf weighing 180 kilos which, sadly, was stillborn. The two elephants that visited us from Twycross Zoo produced two female calves in the late summer. Congratulations to all the staff and to *Chang* our bull elephant!

Jubilee the bull elephant born at Chester in 1977 - and famed for being the first successful Asiatic Elephant birth in the UK - moved to Belfast Zoo in June to socialise with another group and, we hope, embark on a breeding career.

Not to be outdone, the Black Rhino *Esther* produced a female calf *Manyara* in August. Two rhino calves in two years is wonderful news. The male *Quinto* moved to Whipsnade to be paired with *Emma* who was born at Chester in 1991. We received from Whipsnade the male *Kati Kati* who will be paired with *Pangani*, who should give birth in 2000. As *Parky* would not be needed for 12 months, he has been moved temporarily to Zürich Zoo who wanted a breeding bull for their two cows.

We moved *Yodha*, the male Indian Rhino to Berlin Zoo to join two females. Sadly we could not pair this magnificent animal here.

Other highlights include two female Sumatran Orang utan births. These are second generation births at Chester. All of our lemur species bred successfully again, as did the Buffy-headed Capuchins. The groups of Colombian Black Spider Monkeys and Sulawesi Crested Macaques continued to expand. Hopefully the Mandrills will start to breed in 1999 when our male matures. The mixing of the Mandrills, Grivets, Campbell's Guenons and Crested Porcupines has proved a great success and provided a unique opportunity to witness interaction between different species.



Our rare Asiatic Lions produced another three cubs

The hoof stock fared well during the year, with the Burmese Brow Antlered Deer producing two young - but I would love to have seen more sun on their backs.

Overall, 1998 was a very good year.

Nicholas Ellerton, Curator of Mammals

BIRDS

The Christmas gale damage of 1997 required a new roof over the lean-to area of the *Tropical Realm*. The hornbill enclosures and the Congo Peafowl aviary were rebuilt to much improved standards. The bird arcade was re-roofed and temporary repairs made to the bird house and crane fencing. The bird house was demolished at the end of the 1998 breeding season and the crane areas re-fenced. The demolition of the old bird house necessitated the relocation of its former occupants elsewhere in the zoo or to other collections.

Wet, heavy snow in mid-April caused major damage to *Europe on the Edge*, *Condor Cliffs*, the Great Grey Owl aviary, Mauritius Kestrel aviary, Red-crowned Crane enclosure and the *Oakfield* parrot aviaries. Temporary repairs were made and, subsequently, the larger enclosures have been re-netted.

A major redevelopment of the penguin facility included a larger building, new water treatment equipment, a new kitchen and keeper area, and a large walk-in cold room for fish storage. The pool has been re-landscaped and new nesting areas provided. Salt water provides a natural environment for the penguins and allows for protein skimming alongside ozone treatment, sand filtration, UV disinfection and other water purifying methods.



Highlights of another very successful breeding season included a parent-reared Andean Condor. This was the first chick to be successfully parent-reared in the UK. Humboldt's Penguins, Waldrapp Ibis, West African and Red-crowned Cranes, Gough Island Moorhens, Chilean and Caribbean Flamingos were reared. Waterfowl bred included Cuban Whistling Ducks, Marbled Teal, Meller's Ducks, and Smew. Malay Crestless Firebacks were bred for the first time at Chester. A Blyth's Tragopan hatched but did not survive. Green Peafowl (another first at Chester) and Congo Peafowl also bred. Spectacled Owls, Tawny Frogmouths, Kookaburras and Lilac-breasted Rollers were reared. The death of our breeding female Wrinkled Hornbill was a particular blow as this pair had been so successful previously. Green Wood Hoopoes reared chicks for the first time at Chester. Violaceous, Schalow's, Red-crested and White-cheeked Touracos all reared chicks. Yellow-throated Laughing Thrushes and Azure-winged Magpies were bred. Scissor-billed Starlings fledged chicks (for the first time at Chester) and Emerald Starlings again bred. Luzon Bleeding Heart Pigeons and Mountain Witch Doves were reared. New arrivals included Mindanao Bleeding Heart Pigeons. Parrots bred included Red-tailed, Lilacine, Green-cheeked and Cuban Amazons, Blue-eyed Cockatoos, Red-fronted, Blue-winged and Yellow-naped Macaws, Thick-billed Parrot, Golden-capped and Blue-throated Conures, Greater Vasa Parrots, Derbyan Parakeets and a Yellow-backed Chattering Lory. Mount Apo Lorikeets fledged two chicks. This was the first successful breeding of this endangered lorikeet in the UK for over 90 years!

Negotiations are underway for Red Birds of Paradise for our planned *Islands in Danger* exhibit in 1999.

Dr Roger Wilkinson, Curator of Birds

HERPETOFAUNA

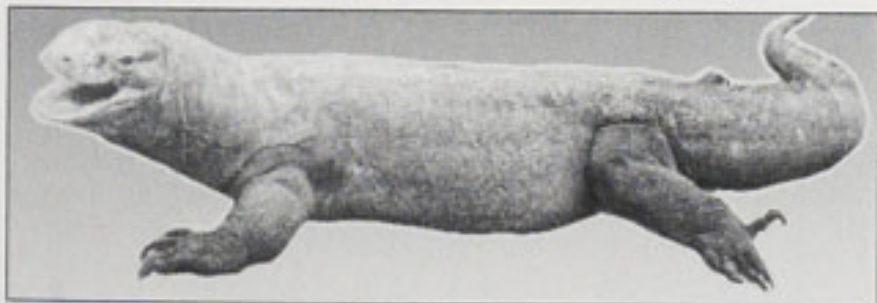
Storm damage to the *Tropical Realm* roof in 1997 and subsequent repairs resulted in a late start to our breeding season. Temperatures plummeted, making it impossible to trigger reproductive cycles for certain species.

However, we have achieved several notable breeding successes including the Sail Fin Lizards, Plumed Basilisks, Cuban Boas, Aruba Island Rattlesnakes, Malayan Box Turtles and Poison Arrow Frogs. We were particularly pleased in September when, two months out of season, our Jamaican Boa gave birth to five healthy youngsters. We were also excited at the prospect of incubating second generation Rhinoceros Iguana eggs but, unfortunately, the female damaged the eggs during laying.

After re-vamping the invertebrate section, we successfully bred Praying Mantis, Jungle Nymphs, Macleay's Spectres, Spiny Stick Insects and Fruit Beetles (*Pachnodas*). A species of Partula Snail (*Partula mirabilis*) new to our collection, arrived in February and they are successfully reproducing. An unusual insect, the Assassin Bug, arrived late in 1998. These curious animals have already produced eggs and although they are not yet on show, they will be part of the 1999 season's exhibits.

The late spring of 1998 saw the finishing touches to the new outdoor Tuatara exhibit. This is the only enclosure of its kind outside New Zealand and we are hoping that the pair introduced in July 1998 respond well to their new environment.

The *Sand Lizard Conservation Project* saw the introduction of two hatched and reared males to the outside exhibit and this year we successfully hatched seven more youngsters.



In November I attended an *International Conference on Komodo Dragons* held at Thoiry Zoo near Paris. As a result of this and previous contacts, we have become involved in one of the most exciting projects in our history. Komodo Dragons from two founder populations are set to arrive in 1999 for both short and longer term residence in the exciting new *Islands in Danger* complex.

Isolde McGeorge, Acting Herpetologist

AQUARIUM

In 1998 we bred Fresh Water Stingrays (*Potamotrygon motoro*), Peacock Gobies (*Tateurndina ocellicauda*), Halfbeaks (*Nomoramphus ebrardti*), Seahorses (*Hippocampus* sp. cf. *abdominalis*), Banggai Cardinal fish (*Pterapogon kauderni*), Catfish (*Corydoras panda* and *C. paleatus*), and all of the Lake Victoria Cichlid and Mexican Goodeid species that we hold.

We repatriated Lake Victoria Cichlids to Genoa Aquarium, Italy, as part of the breeding programme, and some to Bristol Zoo. We sent Omani Blind Cave fish (*Garra barreimiae*) to a conservation centre in the United Arab Emirates specialising in Arabian species, but unable obtain the fish locally. Seahorses (*Hippocampus* sp.) were sent to London Zoo Aquarium, the new *Blue Planet* Aquarium at Ellesmere

Port, Anglesey Sea Zoo, Madrid Zoo Aquarium, and Weymouth Sea Life Centre. Weymouth kindly sent us Australian Big Bellied Seahorses (*H. abdominalis*) in exchange. These bred just after Christmas. *Artis* Aquarium, Netherlands, sent us Banggai Cardinal fish (*Pterapogon kauderni*). HM Customs presented us with threatened hard corals, seized at Manchester Airport.

We have set up and stocked the aquatic areas in the new *Twilight Zone*. The main pool has nocturnal catfish species, which like the bats, are more active in the half light.

We attended meetings of the various aquatic TAGs (Taxon Advisory Groups). One important outcome of the Coral Conservation Group meeting was that dead coral skeletons should not be used in displays. We replaced our hard coral decorations with 'artificial corals' and soft coral cuttings, propagated in the Aquarium. We strongly supported the EUAC meeting at Barcelona Aquarium.

We have an *English Nature* licence to collect native White Clawed Crayfish (*Austropotamobius pallipes*) for the *Monkey Islands* moats. This species is under threat in the UK from imported American Signal Crayfish (*Pasifastacus lenisculus*).

Senior Aquarium Keeper, Justin Bell was asked by WWF (World Wide Fund for Nature) to continue the survey of fishes in Gashaka Gumti, Nigeria begun in 1994 by Professor Reid. Justin spent five weeks in March and April collecting and sampling the river systems in the northern sector and brought back representatives of all the fishes he found. While in America, he visited aquaria involved in the Lake Victoria cichlid breeding programme, and has brought back ideas which should improve our programmes.

In December, I attended a three-day Seahorse Conservation Workshop at the John G. Shedd Aquarium, Chicago. The thirty five participants came from as far as South Africa, Australia, Japan and mainland Europe, as well as the USA. All aspects of husbandry were covered: nutrition, physical parameters, acquisition and disposals. It was useful meeting, sharing observations and ideas for the benefit of seahorses.

Michael Crumpler, Aquarist

ANIMAL SUPPLIES DEPARTMENT

The main target for 1998 was the reduction of overall food costs by attention to every aspect of purchasing. This has been achieved.

Changes to our rat, mouse and locust breeding colonies have increased production. We no longer have the expense of buying in from outside suppliers.

We have continued to expand our use of the retail industry's surplus foodstuffs and, despite the numerous practical problems inherent in the use of this resource, it shows considerable cost saving potential, while nutritional standards are maintained.

Food consumption in Tonnes	
Cereals	370
Fruit and Vegetables	300
Diets	170
Fish	20
Meat	15
Chickens and Rabbits	10
Sundries	15
Total	900

We supplied over 900 tonnes of foodstuffs to the Animal Division including 500,000 invertebrates and 30,000 rodents

Anthony Hutchinson, Animal Supplies Manager

The major new development for 1998 was the completion of the *Twilight Zone*, a new building in West Zoo with a floor area of over 900 m². This contains a massive 5400 m³ free flight area for two species of bats together with a 'bat cave' interpretation area and appropriate 'off show' facilities. This has been a huge success. It sets the standard for the future of animal exhibits at the zoo. Extensive landscaping has been incorporated into the design (see illustration page 3).

In 1998 we maintained the ambitious programme of new works and refurbishment projects established in the previous year. However, gale damage in January and later heavy falls of very wet snow meant we started with a rash of emergency works affecting buildings and structures throughout the zoo. Notable casualties were the *Tropical Realm*, Bird House and three aviaries. In the *Tropical Realm* we completely refurbished the entrance and replaced the lower level roof to the west elevation. We re-opened the building at Easter. The improvements were very apparent. We repaired and re-netted the damaged aviaries. The old Bird House was temporarily secured, until its demolition in June for the preparation of the *Islands in Danger* site.



Structural steelwork for *Islands in Danger*.

The revamped *Rare Penguin Breeding Centre* has a restyled pool with a saline life support system and extensive landscaping and rockwork. Although there have been some initial technical problems, it is yet another exciting attraction in which a comparatively modest injection of cash has resulted in a dramatic improvement to the display. We have matched this with substantial improvements in interpretation.

The *Bull Elephant Centre* has been built with controlled inner access. This is a vital part of our programme for sustained breeding of elephants and thus fulfils the zoo mission. This highly engineered facility will allow 'zero handling' of elephants and ensures the highest standard of safety for the keepers.

Other significant improvements include:

- Demolition of Small Mammal House
- Demolition of Cat House
- New Giraffe House roof
- New hay barn roof
- Bongo house refurbishment
- New Tapir and Capybara enclosure
- New external Tuatara area
- Oakfield beer garden development
- Fountain Shop refurbishment
- New Congo Peafowl enclosure
- Upgrading of crane and waterfowl fencing
- Three replacement catering kiosks, with two new associated Picnic areas redeveloped
- Fish freezer installed
- Rhino house roof
- Temporary heating programme for West Zoo

Maintenance

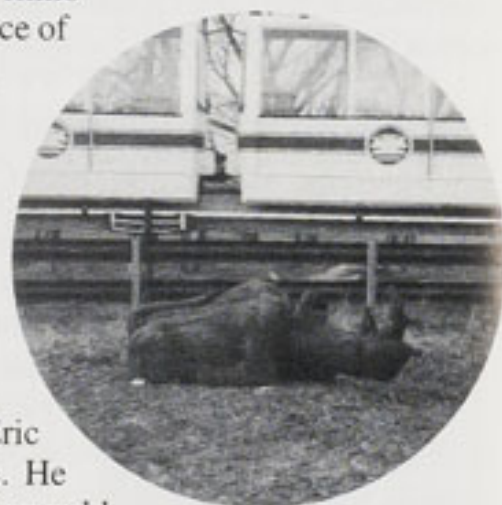
In addition to the existing maintenance work schedule, a new and intensive *planned maintenance* programme has begun. 394 maintenance requests were completed.

Groundstaff

The twenty year high for visitors means a record number of cars. The groundstaff coped admirably with the demands for parking. The car parks and associated roadways themselves received a severe pounding, so that we had a series of repair works to upgrade facilities.

Gardens

The gardeners continued to maintain high standards and were rewarded with their customary awards in both *Chester in Bloom* and *The North West in Bloom*. Staff helped man the zoo's first ever stand at the Southport Flower Show. Ted Roocroft's huge wooden rhino carving was the centrepiece of our display as part of the show's African theme. This is now in a more permanent home in a paddock of his own alongside Monkey Islands station (right).



After thirty two years of service, Head Gardiner, Eric Rudman decided to retire. He will be greatly missed. We would like to thank him for his major contribution in ensuring that our gardens were maintained to the high standards expected of a national institution.

We welcome Mark Sparrow as Curator of Horticulture and Botany. He was appointed in 1998 from the Royal Botanical Gardens, Kew, to join us in January 1999.

Transport

Under the watchful eye of Peter Bartley, the railway had a very successful year. Trains have been upgraded to ensure greater reliability and thus improved visitor satisfaction. The revised commentary, with the flexibility of CD ROM technology, has proved a great success.

Staffing

There have been other significant changes in the staffing levels within the Estates Division. Helen Smith, Divisional Secretary for the past eight years, left to develop her career outside the zoo. Project Engineer Ken Roberts took early retirement after eight very productive years with us. Ken is a Chartered Engineer and has proved a huge asset. He has had a strong input over the years in zoo design developments. We wish all of them well for the future.

Keith Wood, Project Engineer and Paul Evans, Project Engineer and CAD Technician have joined us and are based in the Estates Division offices.

In view of the successful results in 1998, we are looking forward to an exciting and prosperous 1999. Our major works programme includes completion of the new *Bull Elephant Centre*, *Islands in Danger*, new *Wildlife Activity Centre* and *Animal Discovery Centre*, and the major extension and complete refurbishment of the present *Jubilee Restaurant*. Throughout the year we will be planning the *Spirit of the Jaguar* project for 2001.

Stephen O'Brien, Estate Engineer

1998 was a year of expansion for the Education Division. New teaching staff enabled us to fast track the introduction of a new, cost effective schools programme which, judging by the positive feedback from teachers and students, has been very successful.

Closer contact with animals is always an exciting opportunity for visitors and, while intending to construct a dedicated facility for this during 1999, we established the nucleus of an *Animal Discovery* collection in the Education Centre.

Working with the Animal Division, we ran a joint MSc unit on Conservation Biology with Manchester Metropolitan University. This was our first real foray into formal tertiary education and a catalyst, we hope, for more extensive involvement in this market.



Interpretation panel at the *Rare Penguin Breeding Centre*

Interpretation continued to develop ever higher standards, with the highlights of 1998 being the various signs and devices at the new *Rare Penguin Breeding Centre* and in the



Mandrill statue in the *Monkey Islands* indoor area

Twilight Zone. We take interpretation very seriously as this is an important interface with all of our visitors. During the year, we commissioned a design consultancy to conduct an interpretation survey to help us plan for the future. Preliminary results were presented to us in November.

Lynn Wilkinson, our Librarian, left us for a full-time position and we thank her for her outstanding work. We welcome Jane Woodward who was appointed as her successor. Volunteers worked hard to establish a computerised library database and managed to catalogue all of the books.

Volunteers continued to excel throughout the year in their many areas of activity. During 1998 they contributed the time equivalent of six full-time members of staff! One volunteer-led activity which was discontinued was the *Christmas Journey*. Administratively it had started to take too much time away from core activities and - with the proposed introduction in 1999 of a wider-ranging *Winter Festival* - we felt that it should be phased out.

MBNA Bank kindly 'lent' us several members of staff to work as volunteers in the *Let's Make Centre*. We enjoyed having them as part of our team and hope they enjoyed their time with us too.



Foundation slab and wooden uprights for the new *Wildlife Activity Centre*

The Head of Education visited Taiwan in October to attend the *Biennial Conference of the International Association of Zoo Educators*. Four Education staff attended the *Annual Conference of British and Irish Zoo Educators* at Bristol Zoo in November, at which they delivered several presentations.

Stephen McKeown, Head of Education

FINANCE AND ADMINISTRATION

The Division is responsible for key administrative processes and controls, which provide efficient management of the Society's affairs. In particular, financial planning work keeps the achievement of the *Zoo Mission Statement* to the fore.

The Statement of Financial Activities, the accounts, show a record result (p 22). The significance of the dramatic changes of the last few years are explained in the Council Report (p 20), which precedes the report on Financial Activities. Both capital and maintenance expenditure have been sustained at a high level, so that the Zoo is an increasingly well supported and attractive place to visit.

The Development Department now makes an increasingly significant contribution to income flows (see page 19). We congratulate Development Manager John Regan and the zoo team in obtaining the £1.8m sponsorship from *Jaguar Cars Ltd*. Other substantial donations and sponsorships have also

been obtained. Membership and Adoptions continue to advance strongly.

Accountants are sometimes thought of as reporters of dull historical facts. However, we increasingly regard ourselves as co-ordinators and planners. Financial planning for future capital expenditure, such as the *Islands in Danger* and *Jubilee Restaurant* projects, and for more aggressive marketing and promotion, all require constant attention and increasingly sophisticated adjustments.

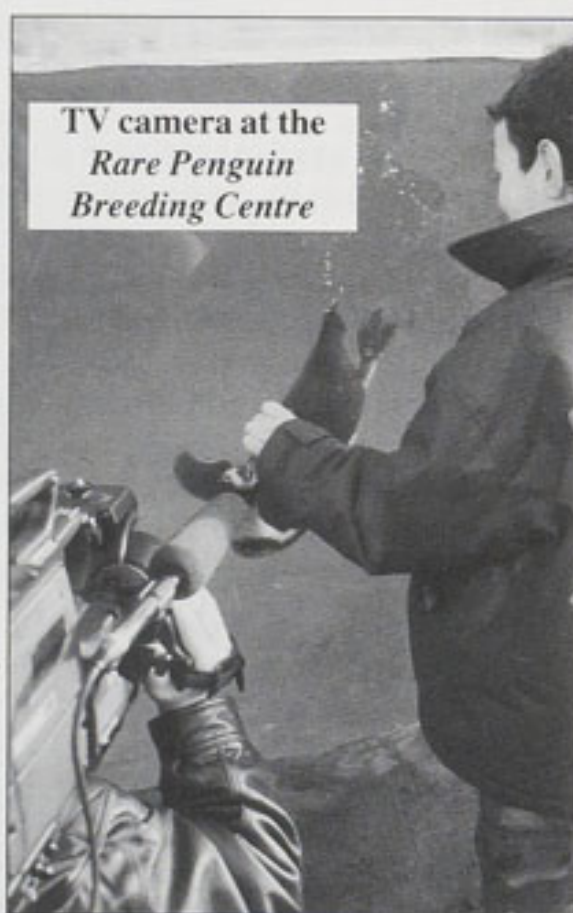
There have been two VAT tribunals during the year. British charitable zoos won their test case to be VAT exempt, but Customs and Excise has appealed and the final result is likely to be known in 1999. In the second tribunal case we sought to show that a main zoo function was education, and therefore exempt from VAT. The Society lost, but it has used the right of appeal.

Michael Johnson, Financial Controller

We benefited greatly from the high profile animals born in the year. The *Twilight Zone* was a most attractive exhibit to feature in advertising. With new arrivals and exhibits to provide real substance for our publicity, we rose to the dual challenges of greater competition and very poor weather at key periods. Additional advertising, more field promotion and tactical discounting in the summer holidays brought the visitors to the zoo.

Our *total visitor count* passed the magic million in early December! This has been achieved in a relatively quiet year for tourism overall, with few other major attractions reporting increases in visitors; and a generally flat and unresponsive retail trading environment.

We were able to reach and sell to a greater audience - booking air time on *Granada, Harlech* and *Central* transmitters - reaching almost one third of the UK. This was backed with an enhanced press campaign covering the whole of our region, including Yorkshire. New arrivals: *Sithami*, the baby elephant and giraffe *Bentley*; and the *Twilight Zone* gave us plenty to talk about. Integral media coupons offering a free child's admission (worth £6) were eagerly used. We took the *Noah's Ark* float to major shows across the region. August results were outstanding. The good results continued to the year end, with the best overall visitor figures for twenty years. *Dwell time*, has been increased, securing the public recommendations that are the finest publicity.



We have more than made up whatever visitors we lost to competition in the leisure market - building business at a time of potential risk - and thus confounding the dismal prediction that anticipated a market situation which could result in losses of a quarter or more of our visitors!

Benefits came from investment in kiosks in the 'back to nature' style, and extra picnic benches. Planning continued for the catering refit. Ratings in the *Association of Leading Visitor Attractions (ALVA)* benchmarking surveys show that the Zoo compares well with our peer group and has an outstanding *dwell time* (see page 9). For a second successive year, we were nominated *Zoo of the Year* by The Good Guide to Britain.



I thank the team for sterling work, with special mentions to the retailers for a magnificent Christmas Grotto at the *Rainbow* and Pat Cade for four outstanding *Zoo Life* magazines. Great credit also to Mike Elkerton and supporters for stalwart work for the *Disabilities Awareness Evening*; to the gardeners for the magnificent newly paved beer garden and help at *Southport Flower Show*; to the caterers for coping so well with demand and to Group Sales for record *Oakfield* bookings at Christmas and the New Year!

Chris Vere, Marketing Manager

INFORMATION SYSTEMS AND TECHNOLOGY

We recognise and appreciate the pioneering work done by Keith Brown in establishing and nurturing our embryonic systems. However, the large demands on IT resources throughout the year resulted in the appointment of a full-time IT Systems Supervisor, Philip Morris. He took up his appointment in November and will continue the development of the Zoo IT infrastructure into the next millennium.

The network system has now been extended to the Gatehouse and the Estates office providing internet and e-mail facilities and the ability to share files within the departments and the whole of the network. An Electronic Time and Attendance system was installed at the Gate House.

Other new technology via telephone lines will allow e-mail services to be delivered where a physical network does not exist. This will be of great benefit to all remote users and also offers the potential for standardisation of software and will, in turn, facilitate the easy exchange of information.

The proposed installation of an additional network server will improve the quality of the Internet connection, providing high quality learning opportunities through the provision of information exchange.

External companies have been invited to offer proposals for the improvement to the zoo's Membership and Adoptions database, with a view to meeting the expanding needs and improving efficiency.

Year 2000 compliance is a priority and work progresses to ensure the computer and engineering systems will operate correctly in the New Year.

Work is continuing on the production of the Zoo CD-ROM that contains lots of useful information and illustrations, demonstrating the award-winning work at Chester Zoo.

Philip Morris, IT Systems Supervisor

Clearly 1998's most exciting news was the sponsorship by *Jaguar Cars* at £1.8 million, as detailed on the Chairman's and Director's page. The Zoo's thanks are especially due to Peter Foden of our *Fundraising Advisory Board* who provided an introduction to Nick Scheele, Chairman of Jaguar. A number of further important contacts and ideas have emerged through the Advisory Board during 1998 (see page 8). The Society is very grateful.

We also thank Lord Leverhulme who made an extremely generous donation of £25,000. Special mention should be made of Mr Joe Dwek, a prominent regional business figure whose generosity supported the transport costs to allow underprivileged schoolchildren to visit the zoo.

On sadder note we heard of the tragic death of Steve Boler, a major regional business figure, who had been in discussions to support the Zoo in a number of ways. His is a great loss to wildlife conservation.

We are grateful to North West Water who sponsored the interpretative material for the *Rare Penguin Breeding Centre*. The John Ellerman Foundation was one of the funders of the *Twilight Zone* and we must also thank the 'shareholders' for their imaginative response to our appeals.

Bequests and the *Legacy Pledge Club*

Legacy income continues to be important to the Zoo. Among several bequests gratefully received (see table) was one for over £32,000 from the estate of Lesley Cole.

A new scheme towards the end of the year was *The Legacy Pledge Club* which has already attracted a number of members. The Society wishes to especially acknowledge those supporters who have not only taken the sensible precaution of making a will, and have been generous enough to mention the Zoo, but

have also taken the trouble to let us know. Among the club's membership who do not wish to remain anonymous are:

John Blewett	}	Members
M. Johnson		
Paul Murphy		
Hilary Murphy		
Frances Stantan		

Michael Johnson	}	Staff
John Regan		



DONATIONS AND BEQUESTS IN 1998 INCLUDED

	£
<i>Bequest from the estate of Lesley Cole</i>	32,133
<i>Lord Leverhulme's Charitable Trust</i>	25,000
<i>The Ronald and Kathleen Pryor Charity</i>	11,000
<i>John Ellerman Foundation</i>	10,000
<i>Railtrack</i>	7,000
<i>In memory of the late Greta Scott</i>	6,494
<i>Roman Garden development (anonymous)</i>	5,000
<i>North West Water</i>	5,000
<i>Capital Bank</i>	3,247
<i>Committee for the Public Understanding of Science (COPUS)</i>	3,000
<i>John Blewett</i>	3,000
<i>The William Adlington Cadbury Trust</i>	2,500
<i>Blake Process Engineering</i>	1,948
<i>Bequest from the estate of Maud Emily Sherwood</i>	2,000
<i>The John Spedan Lewis Foundation</i>	1,000
<i>Bequest from the estate of John Tinston</i>	500
<i>Smaller donations</i>	5,001
TOTAL	123,773

John Regan, Development Manager

MEMBERSHIP, ADOPTIONS AND JUNIORS

MEMBERSHIP

Membership reached an all time high of 13,598 (14% up on 1997) (all categories). Members' meetings continued to be very successful. The spellbinding talk by writer and conservationist, Douglas Adams was especially well received and, due to exceptional demand, seats had to be allocated by ticket.

There was an excellent turn out of members to hear Sir David Attenborough's delightful talk when he visited to receive the Society's *Gold Medal*.

ADOPTIONS

Adoptions income continued to rise steadily in 1998 to an end of year total of £111,000 (14% up on 1997). Two highly successful *Adopter Days* were held. The *Penguin Pyramid* scheme managed to raise some £4,650. A new programme, *Keeper for a Day* was developed towards the end of the year in close co-operation with Animal Division, and is now open to members of the public. Enquiries on this should please be addressed to *Events'Are'Us* on 0151 334 2460 and not to the Zoo.

Adoptions Officer Mary McManus left us in early 1999 to take a new position in publishing. The Zoo Adoptions programme has flourished under her diligent and dedicated management. The Zoo is very grateful to Mary.

John Regan, Development Manager

JUNIOR MEMBERS

Another active year for the Junior Members, thanks to the dedicated help of a small team of regular volunteers. We visited Wenlock Edge in Shropshire searching for fossils, Manchester Museum, The Welsh Mountain Zoo at Colwyn Bay, The Palms at Stapeley, as well as a rare chance to see behind the scenes at the RSPCA's Cattery and Wildlife Hospital in Nantwich. Joint events with the *Cheshire Wildlife Trust* resulted in a (wet!) 'Tree Guardian' day in Delamere Forest and



a joint visit with WATCH members to the Zoo during September. The regular events all proved popular too: Contact Session, Tracks and Signs, Day with a Keeper (above), Summer Barbeque (this year with a talk on Rainforests from Dave Shaw) and the Christmas Party! The Juniors remain supporters of Endorofta School's *Mali Hai Club* in Tanzania and helped fund another educational safari for their students to the Serengeti National Park.

Penny Rudd, Junior Club Leader

The North of England Zoological Society is a registered charity (No. 306077) a company limited by guarantee (No. 287902), regulated by its Memorandum and Articles of Association. The Society owns a trading subsidiary, Chester Zoo Enterprises Ltd, whose profits are covenanted to the Society.

The Council as elected by the members are:

Trustees*	Sub committees				
	Finance	Remuneration	Programmes and Membership	Scientific and Veterinary	Pension Fund**
Keith Maybury (Chairman)	•	•	•	•	
John Brown					
Brian Coles (Vice Chairman)				•	
Dr David Cooke				•	
Karen Davies (May 1998)			•		
Jean Dixon			•		•
Kathryn Edwards			•		
Prof Brian Gardiner					
Brian Livingstone				•	
Derek Lyon (May 1998)				•	
Chris Mahon				•	
John Makinson	•				•
Graham Pollard			•		
Alan Sharples (May 1998)	•	•			
Tony Williams	•				•

* Dates of election in brackets
** Not formally a sub committee of Council.

Beatrice Jones (Chairman)	resigned May 1998
Nicholas Wilson	resigned May 1998
Pat Wisniewski	resigned May 1998

•The registered address is Upton by Chester, Chester, CH2 1LH.

•The principal advisors of the Society are:

Auditors	PricewaterhouseCoopers, Liverpool
Bankers	Barclays Bank plc, Liverpool
Legal Advisors	Mace, Jones, Grundy Kershaw, Liverpool Walker, Smith & Way, Chester

•Investment powers are limited to those available under charity legislation.

•The charity's objectives are to run and develop the zoological gardens. Its policy is the encouragement of people to support wildlife and particular emphasis is placed on conservation, scientific and educational aspects on an international basis.

•The strategic direction and policies of the Society are determined by the elected Council as Trustees, with consultation and discussion with the Director of the Zoo as Chief Executive and his staff who implement policy. The Trustees have six formal meetings a year, together with an Annual General Meeting. The Council Sub-committee structure is indicated against the names (above).

•The development, activities and achievements of the Zoo in 1998 are detailed fully in the *Annual Report*, principally in the Chairman's and Director's Review (p 5).

FINANCIAL REPORT AND ANALYSIS

Financial results 1998 (1997 comparison in brackets):

The net incoming resources for the year of £1,875,000 (£307,000) results from a turnover of £8,891,000 (£7,484,000) less expenses of £7,016,000 (£7,177,000). These figures are derived from the consolidated accounts for the group.

Special income – £100,000 (nil) has been received from *Blue Planet* aquarium for maintenance of goodwill and to avoid disruption to trade and an initial tranche has been received from *Jaguar Cars Ltd* – £602,000 (nil).

Property maintenance £469,000 (£572,000) and fundraising and publicity expenditure £531,000 (£467,000) have remained high.

The operating activities generated a cash flow of £2,195,000 (£1,132,000). This was used for capital expenditure described on page 16 – £1,193,000 (£886,000) and overdraft reduction – £965,000 (£40,000), leaving scope for increased future developments, including the Jaguar project.

PROGRESS TO 2000

The financial strength of the Society has improved considerably during the latter part of the 1990's. This analysis indicates what has happened and how the additional resources available are being used to better serve the conservational and other core objectives of the Zoo.

In the earlier years of this decade, the annual Net Income of the Society ranged between £361,000 and (£362,000) loss. But since 1995 results are consistently better. However, in 1996 and 1997 there have been large disclosed write offs against net income. Thus the Net Incoming Resources as shown in the Annual Report on page 22 understates the real improvement in operational results.

To examine the situation more clearly, we need a better measure and 'cash flow from operating activities' is proposed (see page 24). This does not take account of the effects of the large write-offs in 1996 and 1997. But to take cash flow in isolation, ignores the considerable effect of years in which the weather is good and visitor numbers are high. Conversely, in those years when weather was poor visitor numbers, net income and cash flow were low. If we develop a ratio of cash flow per thousand visitors, the situation becomes clearer with a 75% improvement between 1995 and 1998 in real terms.

	Cash Flow per '000 visitors (adjusted for inflation)
	£
Average for 1990 to 1995	671
Year 1995	898
Year 1996	1399
Year 1997	1105
Year 1998	1574

What has caused the improvement? We can cite :

- High profile births - notably baby elephants *Karha* and *Sithami* and baby rhinos - attracted huge and on-going media interest.
- New exhibits and the new entrance, with its landscaping and greener feel, improved our general presentation and visitors' dwell time.

•Special events - including the *NEZS Gold Medal* presentations to Dr Jane Goodall and Sir David Attenborough, and the Royal opening of *Monkey Islands* - have greatly improved our public perception.

All these factors combined with excellent marketing have enhanced visitor numbers. The wise decision to realign gate prices closer to major competition improved gate income. For example, the *Blue Planet* aquarium opened nearby in July 1998, and as yet, there has been no discernable financial effect on the Zoo. Extra advertising, field promotions and tactical discounting from mid-year 1998 gave the final impetus for record results.

In summary, it is believed that the Society may well have entered a new period, where cash flow has increased from an annual average of £800,000 in 1990-1995 to well over £1.2m per year since then. (This cited improvement ignores the splendid additional 1998 offer of £1.8m sponsorship from *Jaguar Cars Ltd*, which will be received in tranches of £600,000 from 1998 onwards.)

In accordance with the mission of the Society, Council have considered the uses to which the funds should be put. They have designated funds of £2.8m to date to specific animal welfare, conservation and education projects. Council has targeted the improvement of the remaining dilapidated buildings and displays. The difference is already very noticeable. More importantly, the Zoo is developing new exhibits which move it into a world class. The new *Twilight Zone* is, for example, the largest and finest exhibit of bats in the world and future attractions will emulate this. The Estates and Gardens Report on page 16 gives more details.

None of the present strategic aspirations detract from the need to maintain the Zoo's infrastructure soundly and keep the finances well managed and prudently applied.

YEAR 2000 COMPLIANCE AND THE EURO

Computer technology may fail to recognise the internal time clock changes from the 1900's to the year 2000. Computers and electronic chips in other control devices, such as in heating equipment, must therefore be carefully adapted to avoid problems. The Society has checked, and will continue to check, all computers, software and other devices. No substantial defects or breakdowns are so far anticipated.

Several very large suppliers, such as telephone and electricity services leave the Society exposed to an unquantified degree. It is believed that there is only partial cover against potential failure of these services but the Society will arrange for contingency measures as far as is practicable.

Council are not aware of any significant effect on the Zoo from the introduction of the Euro.

Auditors

Our auditors, Coopers & Lybrand, merged with Price Waterhouse on 1st July 1998, following which Coopers & Lybrand resigned and the Council appointed the new firm, PricewaterhouseCoopers as auditors. A resolution to reappoint PricewaterhouseCoopers will be proposed at the Annual General Meeting.

Approved by Council and signed on its behalf by:
Michael Johnson, Company Secretary
26 March 1999

COUNCIL'S RESPONSIBILITIES IN RELATION TO FINANCIAL STATEMENTS

Members of Council are required by UK company law to prepare financial statements for each financial year which give a true and fair view of the state of affairs of the Society and the group as at the end of the financial year and of the net incoming resources of the group for that period.

In preparing those financial statements, Council is required to:

- select suitable accounting policies and apply them consistently.
- make judgements and estimates that are reasonable and prudent.
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that the Society will continue to operate.

Council is responsible for keeping proper accounting records which disclose with reasonable accuracy at any time the financial position of the Society and the group and to enable it to ensure that the financial statements comply with the Companies Act 1985 and applicable accounting standards. It is also responsible for safeguarding the assets of the Society and the group and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

Approved by Council and signed on its behalf by:
Michael Johnson, Company Secretary
26 March 1999

AUDITORS' REPORT TO THE MEMBERS OF THE NORTH OF ENGLAND ZOOLOGICAL SOCIETY

We have audited the financial statements on pages 22 to 25, which have been prepared under the historic cost convention and accounting policies set out on page 25.

Respective responsibilities of Council and auditors

As described above, the Society's Council are responsible for the preparation of financial statements. It is our responsibility to form an independent opinion, based on our audit, on those statements and to report our opinion to you.

Basis of opinion

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

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

Opinion

In our opinion the financial statements give a true and fair view of the state of affairs of the Society and the group at 31 December 1998 and of its incoming resources and application of resources, including its income and expenditure, and of the cash flows of the group for the year then ended and have been properly prepared in accordance with the Companies Act 1985.

PricewaterhouseCoopers
Chartered Accountants and Registered Auditors
Liverpool
26 March 1999

**CONSOLIDATED STATEMENT OF FINANCIAL ACTIVITIES
FOR THE YEAR TO 31 DECEMBER 1998**

	NOTES	1998		1997	
		£ 000's	£ 000's	£ 000's	£ 000's
INCOMING RESOURCES					
Turnover of charitable trading activities	3		4,861		4,339
Other incoming resources					
Members' subscriptions		290		229	
Animal adoptions (restricted)		111		97	
Donations & legacies (see below)		124		96	
Contribution from Deep Sea Leisure Plc.	4	100		-	
Property rents received - external		42		39	
Property rents received - from trading subsidiary	5	297		297	
Net income of trading subsidiary	5	965		390	
			1,929		1,148
TOTAL INCOMING RESOURCES			6,790		5,487
RESOURCES EXPENDED					
Gross expenditure of charitable trading activities	3		988		986
Direct charitable expenditure					
Animal welfare		1,995		2,139	
Education		241		248	
Gardens		341		325	
Property maintenance		469		572	
			3,046		3,284
Other expenditure					
Fundraising and publicity		531		467	
Management and administration		350		443	
			881		910
TOTAL RESOURCES EXPENDED			4,915		5,180
NET INCOMING RESOURCES / MOVEMENT IN FUNDS					
Accumulated funds brought forward	6		1,875		307
			2,862		2,555
ACCUMULATED FUNDS CARRIED FORWARD			4,737		2,862

All activities are continuing.

There is no material difference between the result disclosed above and that on an unmodified historical cost basis.

All the Society's income is unrestricted except for animal adoptions of £111,000 (1997 £97,000) and donations, grants and legacies of £80,000 (1997 £18,000) all held for, or expended on, specific projects. (see note 16)

The Society has no recognised gains or losses other than the net surpluses above and therefore no separate statement of total recognised gains and losses has been presented.

The notes on pages 25 to 27 form part of these financial statements.

BALANCE SHEETS
AT 31 DECEMBER 1998

	NOTES	CONSOLIDATED		SOCIETY	
		1998 £000's	1997 £000's	1998 £000's	1997 £000's
FIXED ASSETS					
Tangible assets	10	4,528	3,924	4,441	3,858
Investment in subsidiary company	11			0	0
		<u>4,528</u>	<u>3,924</u>	<u>4,441</u>	<u>3,858</u>
CURRENT ASSETS					
Stocks	12	276	268	42	52
Debtors	13	1,024	188	949	315
Cash at bank and in hand		322	51	301	40
		<u>1,622</u>	<u>507</u>	<u>1,292</u>	<u>407</u>
CREDITORS:					
AMOUNTS FALLING DUE WITHIN ONE YEAR	14	1,413	1,532	997	1,367
NET CURRENT ASSETS / (LIABILITIES)		<u>209</u>	<u>(1,025)</u>	<u>295</u>	<u>(960)</u>
TOTAL ASSETS LESS CURRENT LIABILITIES		<u>4,737</u>	<u>2,899</u>	<u>4,736</u>	<u>2,898</u>
CREDITORS:					
AMOUNTS FALLING DUE FROM TWO TO FIVE YEARS					
Corporation tax	15	-	37	-	37
NET ASSETS		<u>4,737</u>	<u>2,862</u>	<u>4,736</u>	<u>2,861</u>
FUNDS EMPLOYED					
INCOME FUNDS - RESTRICTED		<u>62</u>	<u>15</u>	<u>62</u>	<u>15</u>
INCOME FUNDS - UNRESTRICTED					
Designated funds		2,858	1,393	2,858	1,393
Other charitable funds		1,817	1,454	1,816	1,453
		<u>4,675</u>	<u>2,847</u>	<u>4,674</u>	<u>2,846</u>
TOTAL FUNDS EMPLOYED	16	<u>4,737</u>	<u>2,862</u>	<u>4,736</u>	<u>2,861</u>

The notes on pages 25 to 27 form part of these financial statements.

The financial statements on pages 22 to 27 were approved by Council and were signed on its behalf by :

.....
Keith Maybury,
Chairman of Council
26 March 1999

.....
Alan Sharples,
Chairman of Finance Committee
26 March 1999

**CONSOLIDATED CASH FLOW STATEMENT
FOR THE YEAR TO 31 DECEMBER 1998**

	NOTES	1998		1997	
		£000's	£000's	£000's	£000's
CASH FLOW FROM OPERATING ACTIVITIES					
Net incoming resources		1,875		307	
Net interest payable		16		89	
(Profit) on sale of fixed assets		-		(2)	
Depreciation charges net of amortisation of capital grants		589		943	
(Increase) / Decrease in stocks		(8)		6	
(Increase) in debtors		(836)		(14)	
Increase / (Decrease) in creditors due within 1 year		578		(91)	
Net cash inflow from operating activities			2,214		1,238
RETURNS ON INVESTMENTS AND SERVICING OF FINANCE					
Interest received		26		7	
Interest paid - bank and other		(45)		(44)	
Interest paid - finance leases		-		(69)	
Net cash outflow from returns on investments and servicing of finance			(19)		(106)
TAXATION					
Net cash outflow from taxation			(37)		(38)
CAPITAL EXPENDITURE					
Receipts from disposal of tangible fixed assets		-		4	
Payments to acquire tangible fixed assets	10	(1,193)		(890)	
Net cash outflow from capital expenditure			(1,193)		(886)
NET CASH INFLOW BEFORE FINANCING					
			965		208
Less : FINANCING					
Repayments of capital element of finance leases	17	-		(168)	
Net cash outflow from financing					(168)
CASH					
Decrease in bank overdraft	17	694		57	
Increase / (Decrease) in cash at bank and in hand		271		(17)	
INCREASE IN CASH IN THE YEAR			<u>965</u>		<u>40</u>

The notes on pages 25 to 27 form part of these financial statements.

NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 1998

1. ACCOUNTING POLICIES

These accounts have been prepared in accordance with the Statement of Recommended Practice (SORP) for Accounting by Charities. The following accounting policies have been applied in dealing with items which are considered material in relation to the financial statements of The North of England Zoological Society ('the Society') and are consistent with those of the 1997 financial statements. The Society's systems analyse expenses departmentally. The SORP calls for expenses to be analysed on an operational basis and accordingly they have been apportioned on this basis.

- (a) **Basis of accounting** - The financial statements have been prepared in accordance with applicable accounting standards in the United Kingdom under the historical cost convention.
- (b) **Basis of consolidation** - The consolidated statement of financial activities, balance sheet and cash flow statement include the financial statements of the Society and its subsidiary undertaking made up to 31 December 1998 and comply with recommended practice for accounting by charities. The net profit of the subsidiary trading company, covenanted to the Society, has been shown as a single line on the statement of financial activities. The turnover and expenses relating thereto are shown in the notes to the financial statements. Its net profit is shown after accounting for various intra-group charges. Rent paid by the subsidiary to the Society has been shown within incoming resources whereas the apportioned overheads, recharged by the Society, have been deducted from the appropriate expense line in the statement of financial activities.
- (c) **Funds employed** - All funds employed must be expended in furtherance of the objects of the Society. Restricted income funds must be used in furtherance of some specific aspect of those objects. Designated funds are those which have been set aside by Council, out of unrestricted funds, for identifiable future expenditure but the designation has an administrative purpose only and does not legally restrict Council's discretion to apply the funds.
- (d) **Fixed assets** - Fixed assets are included in the balance sheets at their cost to the Society.
- (e) **Freehold property** - In accordance with the practice adopted in previous years, no depreciation has been provided on freehold land or property. It is the Society's policy to maintain its property in good condition, prolonging its useful life and making any depreciation provision immaterial. Repairs and maintenance costs are charged against income in the year that they are incurred.
- (f) **Special buildings, enclosures, equipment and monorail system** - Depreciation is provided at rates varying between 4% and 25% per annum, estimated to write off each asset over the term of its useful life. The rates and method of depreciation are consistent with those used in previous years. Grants are amortised at a rate equal to the depreciation rate applied to the asset to which they relate.
- (g) **Animals** - No annual assessment is made of the value of the animal collection. It is valued consistently at a nominal sum and not depreciated. Purchases and sales during the year are treated as revenue transactions.
- (h) **Leases** - Where the Society enters into a lease which entails taking substantially all the risks and rewards of ownership of an asset, the lease is treated as a finance lease. The asset is recorded in the balance sheet as a fixed asset and is depreciated over its estimated useful life. Future installments under such leases, net of finance charges, are included with creditors. Rentals payable are apportioned between the finance element, which is charged to the statement of financial activities as interest, and the capital element, which reduces the outstanding obligation for future instalments. All other leases are operating leases and the rental charges are taken to the statement of financial activities as incurred.
- (i) **Stocks** - Stocks are valued on a basis consistent with that used in previous years at the lower of cost and estimated net realisable value.
- (j) **Turnover** - Turnover represents cash and invoiced amounts of admission charges, goods sold and services provided (stated net of value added tax).
- (k) **Pensions** - The Society operates a voluntary pension scheme covering the majority of permanent employees providing benefits based on final pensionable pay. The assets of the scheme are held in trustee administered funds completely independent of the Society's finances. Contributions to the scheme are charged to the statement of financial activities so as to spread the cost of pensions over the employees' working lives with the Society.
- (l) **Property Sales** - Profit on sales of land and buildings consists of the difference between the net amount realised and the sum of cost and subsequent additions and is reported separately on the face of the statement of financial activities in any year where a sale has occurred.

2. STATUS

The Society is a company limited by guarantee and has no share capital. Members have guaranteed the liabilities of the Society to the extent of £1 each. The Society is registered with the Charity Commission No. 306077. As a registered charity, the Society is entitled to claim exemption from the charge to tax on income and chargeable gains at Section 505 Income and Corporation Tax Act 1988 and Section 256 Taxation of Chargeable Gains Act 1992. In the opinion of Council no corporation tax liability arose in respect of the Society's activities in the year.

3. CHARITABLE TRADING ACTIVITIES

Turnover	1998		1997	
	£ 000's	£ 000's	£ 000's	£ 000's
Zoo admissions	4,285		3,841	
Monorail and boats	294		250	
Guides and other	282	4,861	248	4,339
Gross expenditure				
Zoo admissions	604		604	
Monorail and boats	244		230	
Guides and other	140	988	152	986
		3,873		3,353

4. CONTRIBUTION FROM DEEP SEA LEISURE PLC.

Under the terms of an agreement dated 15 August 1996, between the Society and Deep Sea Leisure Plc, which has developed an aquarium at Ellesmere Port; the Society will receive 4 payments of £100,000 each, annually from July 1998 to July 2001, for maintenance of goodwill and to avoid disruption of trade.

5. TRADING SUBSIDIARY - CHESTER ZOO ENTERPRISES LIMITED

	1998			1997	
	Catering £ 000's	Shops 1998 £ 000's	Sponsorship £ 000's	Total £ 000's	£ 000's
Turnover	1,977	1,451	602	4,030	3,145
Direct Costs	1,370	910	-	2,280	2,049
Gross profit	607	541	602	1,750	1,096
Indirect Costs					
- property rents paid to parent company	160	137	-	297	297
- management charges paid to parent company	272	140	-	412	348
- other overheads	72	4	-	76	62
Net profit	103	260	602	965	389
Amount covenanted to the Society				965	390
Retained in subsidiary				0	(1)

6. NET MOVEMENT IN FUNDS

This is after charging:	1998		1997	
	£ 000's	£ 000's	£ 000's	£ 000's
Auditors' remuneration - audit (Society : £ 8,000, 1997 £ 8,000)		12		11
- non-audit		10		-
Depreciation (net of grant amortisation)		589		943
Hire of equipment		21		15
Interest payable - bank	42		44	
Interest payable - finance leases	0		52	
	42		96	
Less : Interest receivable	26	16	7	89
Operating lease rentals - plant and equipment		8		7

As permitted by Section 230 of the Companies Act 1985 the Society's results are included in the consolidated statement of financial activities and no separate statement of financial activities is presented. The Society's surplus for the financial year, determined in accordance with the Companies Act, was £1,875,000. (1997: £308,000)

7. DIRECTORS

(a) Remuneration and expenses

The members of Council, being charity trustees, received no remuneration (1997 Nil).

One trustee was reimbursed during the year for travelling expenses necessarily incurred. The aggregate amount of those expenses was £ 144. (1997 £ 144).

(b) Transactions with trustees.

The Society entered into one contract with an organisation with which a Trustee has business connections (1997, Nil). Chris Mahon is Managing Director of Cheshire Ecological Services, the consultancy arm of Cheshire Wildlife Trust, which was paid £1,414 to carry out an ecological survey of the zoo estate.

(c) Trustee indemnity insurance

Insurance costing £2,000 (1997 £ 3,000) has been taken out by the Society to protect the Society, its trustees and other officers against the consequences of any neglect or default on their part.

8. EMPLOYEES

(a) Aggregate staff costs

	1998 £ 000's	1997 £ 000's
Wages and salaries	3,023	2,726
Social security costs	257	227
Other pension costs	193	155
	<u>3,473</u>	<u>3,108</u>

(b) Emoluments

The number of employees, including those employed for only part of the year, whose emoluments for the year (excluding pension contributions) fell within each band of £10,000 from £40,000 upwards was as follows :

	1998 Number	1997 Number
From £40,001 to £50,000	1	1
From £50,001 to £60,000	1	1

(c) Number of persons employed

The average (full time equivalents) throughout the financial year was as follows :

	Permanent	Temporary	Permanent	Temporary
Animal Welfare	58	5	56	4
Maintenance and gardens	47	11	49	12
Education	6	-	4	-
Publicity and fundraising	6	-	6	-
Catering and shops	24	50	18	54
Administration	<u>22</u>	<u>5</u>	<u>21</u>	<u>8</u>
	<u>163</u>	<u>71</u>	<u>154</u>	<u>78</u>

9. PENSIONS

Pension contributions are determined by a qualified actuary on the basis of triennial valuations using the projected unit method. The assumptions which have the most significant effect on the results of the valuations are those relating to the valuation rate of interest (9 % pa.) the rate of future salary inflation and future increases in Lower Earnings Limit (7% pa.) the rate of future pension increases (4 % pa.) and the rate of future dividend growth (4.5% pa.). The most recent valuation was at 31 December 1996 which showed that the market value of the scheme's assets was £ 3,088,000 and that the actuarial value of those assets represented 107.4 % of the benefits that had accrued to members, after allowing for an increase in pensions, in line with the increase in the Retail Prices Index, with effect from 1 January 1998.

In addition to the cost of reinsuring the lump sum death benefit, the contributions made to the scheme have been:

	Members	Society
6 % Contributory members	6 %	19.3 %
3 % Contributory members	3 %	11.0 %

The actuary gave it as his opinion that, provided contributions continued at the rates as set out above, the next actuarial valuation as at 31 December 1999 would be expected to show that the resources of the Scheme were likely, in the normal course of events, to be sufficient to meet in full the liabilities of the Scheme as they fell due. Contributions amounting to £20,000 were due by the Society at the year end and are included in creditors (1997 £9,000 prepaid, in debtors).

10. TANGIBLE FIXED ASSETS

		Freehold property £000's	Buildings & enclosures £000's	Monorail system £000's	Machinery & equipment £000's	Animals £000's	Total £000's
CONSOLIDATED COST	At 1 January 1998	581	4,127	1,516	750	1	6,975
	Additions	(6)	1,020	6	173	-	1,193
	Disposals / Written off	-	(159)	-	(164)	-	(323)
	At 31 December 1998	<u>575</u>	<u>4,988</u>	<u>1,522</u>	<u>759</u>	<u>1</u>	<u>7,845</u>
DEPRECIATION	At 1 January 1998	-	1,321	1,339	391	-	3,051
	Provided during year	-	374	52	163	-	589
	Disposals / Written off	-	(159)	-	(164)	-	(323)
	At 31 December 1998	<u>-</u>	<u>1,536</u>	<u>1,391</u>	<u>390</u>	<u>-</u>	<u>3,317</u>
NET BOOK VALUE	At 31 December 1998	<u>575</u>	<u>3,452</u>	<u>131</u>	<u>369</u>	<u>1</u>	<u>4,528</u>
	At 1 January 1998	<u>581</u>	<u>2,806</u>	<u>177</u>	<u>359</u>	<u>1</u>	<u>3,924</u>
	The net book value at 31 December 1998 represents fixed assets used for :						
	Charitable trading activities	-	914	131	35	-	1,080
	Direct charitable purposes	-	2,317	-	154	1	2,472
	Other purposes	575	221	-	180	-	976
		<u>575</u>	<u>3,452</u>	<u>131</u>	<u>369</u>	<u>1</u>	<u>4,528</u>
	The depreciation charged for the year to 31 December 1998 was allocated :						
	Charitable trading activities	-	45	52	11	-	108
	Direct charitable purposes	-	298	-	80	-	378
	Other purposes	-	31	-	72	-	103
		<u>-</u>	<u>374</u>	<u>52</u>	<u>163</u>	<u>-</u>	<u>589</u>

Animal purchases of £ Nil (1997 £11,000) and sales of £5,000 (1997 £1,000) have been treated as revenue transactions.

Included in the total net book value of tangible fixed assets is £35,000 (1997 £52,000) in respect of the Monorail system acquired under 'finance' leases. Depreciation for the year on these assets was £17,000 (1997 £17,000).

An additional £456,000 depreciation was provided in 1997 in respect of some buildings acquired before 1992, which principally relates to animal welfare, to convert their method of depreciation from reducing balance to straight line basis, so as to be consistent with the method used in respect of assets purchased subsequently and to reflect their remaining useful life.

Council considers that the market value of the Society's land, property and buildings exceeds their book values.

TANGIBLE FIXED ASSETS - Continued

All the tangible fixed assets included in the consolidated statement above relate entirely to the Society with the exception of the machinery and equipment where the equivalent figures for the Society alone are:

	COST £000's	DEPRECIATION £000's	NET BOOK VALUE £000's
At 1 January 1998	594	301	293
Additions	123	-	123
Disposals	(164)	(164)	-
Provided during year	-	134	(134)
At 31 December 1998	553	271	282

11. INVESTMENT IN SUBSIDIARY COMPANY

The Society has a wholly owned trading subsidiary, comprising 100 ordinary £1 shares in Chester Zoo Enterprises Limited, incorporated in the UK, which operates the catering and retail activities of the zoo from outlets rented from the Society. It covenants its taxable profit to The North of England Zoological Society. A summary of its trading results has been included in Note 5 above. Audited accounts for the year to 31 December 1998 will be filed with the Registrar of Companies.

12. STOCKS

	GROUP		SOCIETY	
	1998 £000's	1997 £000's	1998 £000's	1997 £000's
Goods for resale	239	239	5	23
Consumables	37	29	37	29
	276	268	42	52

The replacement cost of the above stocks would not be significantly different from the values stated.

13. DEBTORS

	GROUP		SOCIETY	
	1998 £000's	1997 £000's	1998 £000's	1997 £000's
Trade debtors	744	10	26	7
Intra group debtor	-	-	581	93
Other debtors	248	137	310	175
Prepayments and accrued income	32	41	32	40
	1,024	188	949	315

14. CREDITORS - AMOUNTS FALLING DUE WITHIN ONE YEAR

	GROUP		SOCIETY	
	1998 £000's	1997 £000's	1998 £000's	1997 £000's
Bank overdraft (secured)	242	936	207	923
Corporation tax	38	38	38	38
Trade creditors	653	313	589	261
Other taxes and social security costs	360	143	53	49
Other creditors	28	3	28	3
Accruals	92	99	82	93
	1,413	1,532	997	1,367

The bank overdraft is secured by a fixed charge on the freehold property.

15. CORPORATION TAX

As the Society is a Registered Charity it had been considered that no tax liability (other than V.A.T.) arose on income. However in 1993 the Inland Revenue raised an assessment on certain of the catering and souvenir retailing activities in respect of the financial years up to 1991. A settlement figure of £225,000 was agreed, payable in 6 equal instalments of £37,500, interest free, from 1994 to 1999.

Since 1 January 1992 any commercial activity which falls outside the statutory exemption for the purposes of Corporation Tax has been conducted through Chester Zoo Enterprises Limited, which covenants all its taxable profits annually to the Society.

16. FUNDS EMPLOYED

	Balance 1 January 1998 £000's	New funds £000's	Funds Utilised £000's	Balance 31 December 1998 £000's
Restricted Income Funds				
Animal adoptions scheme	0	111	111	0
Animal welfare projects	12	52	31	33
Education projects	3	23	2	24
Other capital projects	0	5	0	5
	15	191	144	62
Designated Funds				
Animal welfare projects	1,089	1,883	1,197	1,775
Education projects	110	81	68	123
Other capital projects	194	994	228	960
	1,393	2,958	1,493	2,858
Other Charitable Funds	1,454	3,641	3,278	1,817
Total Funds Employed	2,862	6,790	4,915	4,737

17. ANALYSIS OF CHANGES IN NET DEBT DURING THE YEAR

	Balance 1 January 1998 £000's	Cash Flow in 1998 £000's	Balance 31 December 1998 £000's
FINANCING			
Finance leases, being total financing	0	0	0
CASH			
Bank overdraft	(936)	694	(242)
Cash at bank and in hand	51	271	322
Total net cash	(885)	965	80
NET DEBT	885	(965)	(80)

18. FINANCIAL COMMITMENTS

	GROUP		SOCIETY	
	1998 £000's	1997 £000's	1998 £000's	1997 £000's
Capital expenditure, contracted for but not provided:	383	404	383	404
There is an annual commitment in respect of operating leases which expire within two to five years of:-	8	9	8	9

19. CONTINGENT LIABILITIES

In 1989, under Section 4 of the Development of Tourism Act 1969, the Society received a grant from the English Tourist Board of £40,000 towards the cost of building the new Chimpanzee House. Under certain circumstances this grant could become repayable, although no liability is expected to arise.



Chester Zoo's global involvement in conservation and scientific study in 38 countries.

North and South America

1 Brazil

- Snake bite antidote project with the Government of Brazil and Liverpool School of Tropical Medicine

2 Canada

- Financial support for Puerto Rico Crested Toad study at Toronto Metro Zoo
- Peary's Caribou PHVA Workshop (CBSG/IUCN project)

3 Chile

- Humboldt's Penguin PHVA Workshop (CBSG/IUCN project)

4 Costa Rica

- Director's Zoo liaison visit
- Orchid CAMP study (CBSG/IUCN project)

5 Mexico

- Director's participation in Aquatic Conservation Conference
- FAITAG field survey and aquarium husbandry training initiatives
- Support for Consortium of Mexican Universities
- Sea Lion CAMP workshop (CBSG/IUCN project)

6 USA

- Aquarist's participation in Seahorse Conference
- Aquarist and staff study visit to major aquaria
- Maple Leaf Mussel PHVA Workshop (CBSG/IUCN project)
- Staff participation at Flamingo Specialist Workshop group
- Research student at Chester

Europe

7 Denmark

- Keeper Exchange with Aalborg Zoo

8 Eire

- Development Manager's liaison visit to Dublin Zoo
- Advice on new Retail Shop
- Research Student at Chester

9 France

- Staff participation at Komodo Dragon Conference

10 Germany

- Director and Curators' participation at EAZA Conference
- Director's participation at EAZA research meetings
- Chief Curator, Estate Engineer and staff study visit to elephant holding facilities
- Transfer of Indian Rhino to Berlin Zoo

11 Greece

- Research Student at Chester

12 Hungary

- Director's inspection of Budapest Zoo

13 Italy

- Transfer of Lake Victoria Cichlids to Genoa Aquarium
- Research on pheasants at Bologna DNA laboratory

14 The Netherlands

- Curator's and staff participation at Elephant Workshop
- Director's participation at EUAC Committee meeting
- Chief Curator, Estate Engineer and staff study visit to elephant holding facilities
- Work Experience Student at Chester
- Transfer of Banggai Cardinal Fish stock from Artis Zoo Aquarium, Amsterdam

15 Spain

- Director and staff participation at EUAC Conference
- Iberian Lynx PHVA Workshop (CBSG/IUCN project)
- Transfer of Lake Victoria Cichlids to Madrid Zoo Aquarium

16 Sweden

- Work Experience Student at Chester

17 Switzerland

- Transfer of Black Rhinoceros to Zurich Zoo

18 UK

- Director's address to British and European Zoo and Wildlife Veterinarians' Conference held in Chester
- English Nature Species Recovery Programme for Tadpole Shrimp and Sand Lizard
- Harvest Mouse conservation programme

19 Canary Islands

- Cheshire Barn Owl Release programme
- Local Bat surveys
- Elephant transfer to Belfast Zoo
- Seahorse transfers to London Zoo, Blue Planet Aquarium, Anglesey Sea Zoo, Bristol Zoo, and Weymouth Sea Life Centre

Africa

19 Canary Islands

- Curatorial participation at Parrot Convention

20 Madagascar

- Lemur studies in behavioural ecology
- Black and White Lemur re-introduction project support

21 Mauritius

- Rodrigues Island Fruit Bat research
- Rodrigues Island Fruit Bat seeds dispersal study

22 Namibia

- Chief Curator's study visit to AFRICAT
- Equipment support for AFRICAT

23 Nigeria

- Staff survey of fish species for WWF, Gashaka Gumti
- Staff survey of Chimpanzees for WWF, Gashaka Gumti
- Liaison visits to Chester by WWF and Nigerian staff
- Support for Nigerian Conservation Foundation and Nigerian Field Society

24 South Africa

- Director's participation at WWF Biodiversity Planning Workshop
- Second Members' Safari

25 Tanzania

- Continued Junior Members support for Mali Hai Club at Endarofa Secondary School
- Cichlid fish research, Lake Tanganyika

26 Zambia

- Research support, behavioural study, Helmet Shrikes

27 Zimbabwe

- Research support, Hunting Dog ecology study

Asia

28 China

- Conservation research advice

29 India

- Zoo Outreach India programme support

30 Japan

- Director's participation at World Zoo Conference, Tokyo and Nagoya

- Director's private audience with HIM The Emperor of Japan in London

- Research Student at Chester

31 New Britain

- Blue eyed Cockatoo field study

32 New Caledonia

- Skink and Gecko ecological research support

33 The Philippines

- Curator's FFI liaison visit to Chester. Polillo Island, Spotted Deer and Hornbill projects
- Joint support for Spotted Deer recovery programme in the field

34 Taiwan

- Head of Education's participation at International Zoo Educators' Conference

35 Thailand

- Conservation research advice

36 United Arab Emirates

- Transfer of Omani Blind Cave Fish back to country of origin
- Identification work for Animal Management Consultancy

37 Vanuatu

- Conservation programme, Royal Parrot Finch

Australasia

38 Australia

- Liaison visit from Adelaide Zoo's Marketing Manager
- Research Student at Chester
- Work Experience Students at Chester
- Orang utan transfer from Perth Zoo

SUMMARY – LIVESTOCK GENERAL HOLDINGS – TOTALS AS AT 31ST DECEMBER 1998

	Number of Species	(End 97)	Number of Specimens	(End 97)	Species Bred & Reared	(End 97)	Specimens Bred & Reared	(End 97)
Mammals	78	77	652	668	37	33	70	136
Birds	225	221	958	1017	73	68	222	262
Reptiles	48	51	268	267	10	13	127	143
Amphibians	15	16	232	134	3	3	115	46
Fishes	129	122	3163	3123	43	42	not included	not included
Invertebrates	36	36	1407	1386	20	18	not included	not included
Total	531	523	6680	6577	186	177	534	587

SUMMARY – THREATENED SPECIES 1998

	1998	(1997)		1998	(1997)		1998	(1997)
Threatened species	253	(257)	Threatened species bred to date	177	(188)	Species with zoo community re-introduction plans	37	(38)
% of all livestock	48%	(49%)	% of threatened species bred	70%	(73%)	% of threatened species with re-introduction plans	15%	(15%)

SUMMARY OF TRANSFERS TO OTHER COLLECTIONS 1998

Mammals	27 species were sent to 20 collections	Birds	50 species were sent to 39 collections	1998 total transfers	94 species
Aquarium	17 species were sent to 10 collections				

EXPLANATION OF CODES USED

WORLD CONSERVATION UNION (IUCN) AND BIRDLIFE INTERNATIONAL (ICBP) CODES:

THREATENED (T) Threatened is a general term to denote species which are 'Endangered', 'Vulnerable', 'Rare', 'Indeterminate' or 'Insufficiently Known' and should not be confused with the use of the same term by the US Office of Endangered Species. In previous volumes it has been used to identify taxa comprised of several sub-taxa which have differing status categories.

COMMERCIALY THREATENED (CT) Taxa not currently threatened with extinction, but most or all of whose populations are threatened as a sustainable commercial resource, or will become so, unless their exploitation is regulated. This category applies only to taxa whose populations are assumed to be relatively large. In practice, this category has only been used for fish and aquatic invertebrate species of commercial importance that are being overfished in all or parts of their ranges.

NEAR THREATENED (NT) In a 'Low Risk' category and does not qualify for any of the categories 'Critical', 'Endangered', 'Vulnerable' etc., but are close to qualifying for the threatened categories.

EXTINCT (Ex) Species not definitely located in the wild during the past 50 years (criterion as used by the Convention on International Trade in Endangered Species of Wild Fauna and Flora). On a few occasions, the category Ex? has been assigned; this denotes that it is nearly certain that the taxon has recently become extinct but some doubt remains.

CRITICAL (C) A taxon is 'Critically Endangered' when it is facing a very high risk of extinction in the wild in the immediate future.

ENDANGERED (E) Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included are taxa whose numbers have been reduced to a critical level, or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction. Also included are taxa that may be extinct but have definitely been seen in the wild in the past 50 years.

VULNERABLE (V) Taxa believed likely to move into the 'Endangered' category in the near future if the causal factors continue operating. Included are taxa of which most or all the populations are decreasing because of over-exploitation, extensive destruction of habitat or other environmental disturbance; taxa with populations that have been seriously depleted and whose ultimate security has not yet been assured; and taxa with populations that are still abundant but are under threat from severe adverse factors throughout their range. NB. In practice, 'Endangered' and 'Vulnerable' categories may include, temporarily, taxa whose populations are beginning to recover as a result of remedial action, but whose recovery is insufficient to justify their transfer to another category.

DECLINING (D) Population in moderate decline and population more than 10,000 breeding pairs or 40,000 wintering individuals.

RARE (R) Taxa with small world populations that are not at present 'Endangered' or 'Vulnerable', but are at risk. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range.

LOCALISED (L) Population more than 10,000 breeding pairs or 40,000 wintering birds, and neither in moderate nor in large decline, but with more than 90% of the population occurring at 10 or fewer sites (Important Bird Areas) as listed in Grimmett and Jones (1989).

INDETERMINATE (I) Taxa known to be 'Endangered', 'Vulnerable'

or 'Rare' but where there is not enough information to say which of the three categories is appropriate.

INSUFFICIENTLY KNOWN (K) Taxa that are suspected but not definitely known to belong to any of the above categories, because of lack of information.

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES (CITES) CODES:

APPENDIX I Includes species threatened with extinction and for which trade must be subject to particularly strict regulation and only authorised in exceptional circumstances.

APPENDIX II species are not necessarily now threatened with extinction but may become so unless trade is strictly regulated. Appendix II further contains so-called look-alike species, which are controlled because of their similarity in appearance to the other regulated species, thereby facilitating a more effective control.

APPENDIX III includes species that are subject to regulation within the jurisdiction of a Party and for which the cooperation of other Parties is needed in order to prevent or restrict their exploitation.

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ABBREVIATED CODES

Ex = Extinct in wild form	I = Indeterminate	X = bred in indicated period
E = Endangered	K = Insufficiently known	C = Critical (by Birdlife)
V = Vulnerable	K* = Under Review	NT = Listed as Near Threatened by Birdlife
R = Rare	D = Declining	1 = CITES I 2 = CITES II
L = Localised (European status in parenthesis)	S = Safe N/A = Not applicable	3 = CITES III C1 = Annex C1

RE-INTRO PROG = Species held at Chester Zoo that are, or have been, the subject of zoo community re-introduction programmes (but not necessarily with NEZS).

X^ = Local/English Nature programmes * not currently in a breeding pair or group + recent arrivals or not yet of breeding age.

Note: We are reviewing Mace/Lande genetic and demographic coding for future Livestock Reviews.

SUMMARY OF THREATENED SPECIES BY CATEGORY

	IUCN		Total	IUCN Red List by Category		CITES I	CITES II	CITES III	BIRDLIFE
	Red List	Other Categories		Ex	8				
MAMMALS	37	9	46	E	33	68	104	10	90
BIRDS	52	80	132	V	47				
REPTILES	11	19	30	R	23				
AMPHIBIANS	1	3	4	I	5				
FISHES	27	1	28	K	14				
INVERTEBRATES	4	9	13	K*	1				
TOTALS	132	121	253	V/R	1				

For explanation of codes, see p37.

MAMMALS		IUCN Red List	BRED 98	BRED <98	CITES Listing	Re-Intro Prog
1	Rodrigues Fruit Bat	<i>Pteropus rodricensis</i>	E	X	X	2
2	Ring-tailed Lemur	<i>Lemur catta</i>	V	X	X	1
3	Black and White Ruffed Lemur	<i>Varecia variegata variegata</i>	E	X	X	1 X
4	Red Ruffed Lemur	<i>Varecia variegata rubra</i>	E	X	X	1
5	Cotton Topped Tamarin	<i>Saguinus oedipus oedipus</i>	E	X	X	1 X
6	Buffy Headed Capuchin	<i>Cebus apella xanthosternus</i>	V	X	X	1
7	Colombian Black Spider Monkey	<i>Ateles fusciceps robustus</i>	V	X	X	2
8	Lion-tailed Macaque	<i>Macaca silenus</i>	E	X	X	1
9	Sulawesi Crested Macaque	<i>Macaca nigra</i>	I	X	X	2
10	Mandrill	<i>Mandrillus sphinx</i>	V			1
11	Chimpanzee	<i>Pan troglodytes</i>	V	X	X	1 X
12	Bornean Orang utan	<i>Pongo pygmaeus pygmaeus</i>	E	X		1 X
13	Sumatran Orang utan	<i>Pongo pygmaeus abelii</i>	E	X	X	1 X
14*	Red Squirrel	<i>Sciurus vulgaris</i>				
15	Maned Wolf	<i>Chrysocyon brachyurus</i>	V			1
16	Bush Dog	<i>Speothos venaticus</i>	V	X		1
17	Oriental Small-clawed Otter	<i>Aonyx cinerea</i>	K	X		2
18	Caracal Lynx	<i>Felis caracal</i>		X		2
19	Jungle Cat	<i>Felis chaus</i>		X		2
20	Scottish Wild Cat	<i>Felis sylvestris</i>	X	X		2
21	European Lynx	<i>Felis lynx</i>		X		2
22	Serval Cat	<i>Felis serval</i>		X		2
23	Ocelot	<i>Felis pardalis</i>	V			1
24	Margay	<i>Felis wiedi</i>	K	X		1
25	Persian Leopard	<i>Panthera pardus saxicolor</i>	I	X		1
26	Siberian Tiger	<i>Panthera tigris altaica</i>	E	X		1
27	Asiatic Lion	<i>Panthera leo persica</i>	E	X	X	1
28	Cheetah	<i>Acinonyx jubatus</i>	V			1 X
29	Asiatic Elephant	<i>Elephas maximus</i>	E	X		1
30	Persian Onager	<i>Equus hemionus onager</i>	E	X	X	2 X
31	Przewalski Horse	<i>Equus przewalskii</i>	Ex	X	X	1 X
32	South American Tapir	<i>Tapirus terrestris</i>		X		2
33	Black Rhinoceros	<i>Diceros bicornis</i>	E	X		1
34*	Indian Rhinoceros	<i>Rhinoceros unicornis</i>	E			1
35+	Babirusa	<i>Babirusa babirusa</i>	V			
36	Guanaco	<i>Lama guanicoe</i>		X	X	2
37	Chilean Pudu	<i>Pudu pudu</i>	K	X		1
38	Burmese Brow Antlered Deer	<i>Cervus eldi thamin</i>	V	X	X	1
39	Père David's Deer	<i>Elaphurus davidianus</i>	E	X	X	X
40*	Lowland Anoa	<i>Bubalus depressicornis</i>	E			1
41	American Bison	<i>Bison bison</i>		X	X	X
42	Bongo	<i>Tragelaphus eurycerus</i>	V	X	X	3
43	Kafue Flats Red Lechwe	<i>Kobus leche kafuensis</i>	V	X	X	2
44	Scimitar-horned Oryx	<i>Oryx dammah</i>	E	X	X	1 X
45	Blackbuck	<i>Antelope cervicapra</i>	V	X	X	3
46	Arabian Gazelle	<i>Gazella gazella arabica</i>	V	X	X	

MAMMALS on loan at other Zoos

Rodrigues Fruit Bat	<i>Pteropus rodricensis</i>	E				2
Ring-tailed Lemur	<i>Lemur catta</i>	V				
White Fronted Lemur	<i>Lemur fulvus albifrons</i>	R	X			1
Black and White Ruffed Lemur	<i>Varecia variegata variegata</i>	E				1
Cotton Topped Tamarin	<i>Saguinus oedipus</i>	E				1
Colombian Black Spider Monkey	<i>Ateles fusciceps robustus</i>	V				2
Sulawesi Crested Macaque	<i>Macaca niger</i>	I				2
Lion-tailed Macaque	<i>Macaca silenus</i>	E				1
Bornean Orang utan	<i>Pongo pygmaeus pygmaeus</i>	E				1
Sumatran Orang utan	<i>Pongo pygmaeus abelii</i>	E				1

Eastern Lowland Gorilla	<i>Gorilla gorilla graueri</i>	E				1
White-handed Gibbon	<i>Hylobates lar</i>					1
Bush Dog	<i>Speothos venaticus</i>	V				1
Margay	<i>Felis wiedi</i>	K				1
Geoffroy's Cat	<i>Felis geoffroyi</i>					2
Asiatic Lion	<i>Panthera leo persica</i>	E				1
Asiatic Elephant	<i>Elephas maximus</i>	E				1
Persian Onager	<i>Equus hemionus onager</i>	E				2
South American Tapir	<i>Tapirus terrestris</i>					2
Black Rhinoceros	<i>Diceros bicornis</i>	E				1
Southern White Rhinoceros	<i>Ceratotherium simum simum</i>	V				1
Guanaco	<i>Lama guanicoe</i>					2
Père David's Deer	<i>Elaphurus davidianus</i>	E				
Bongo	<i>Tragelaphus eurycerus</i>	V				3
Kafue Flats Red Lechwe	<i>Kobus leche kafuensis</i>	V				2
Scimitar-horned Oryx	<i>Oryx dammah</i>	E				1
Blackbuck	<i>Antelope cervicapra</i>	V				3
Arabian Gazelle	<i>Gazella gazella arabica</i>	V				

BIRDS

		IUCN Red List	BRED 98	BRED <98	CITES Listing	Birdlife Listing	CAMP Status	Re-Intro Prog
1	Ostrich	<i>Struthio camelus</i>			X	1		
2	Common Rhea	<i>Rhea americana</i>			X	2	NT	
3	Humboldt's Penguin	<i>Spheniscus humboldti</i>	K*	X	X	1	NT	
4	White Stork	<i>Ciconia ciconia</i>			X		(V)	
5	Black Stork	<i>Ciconia nigra</i>				2(C1)	(R)	
6+	White Pelican	<i>Pelecanus onocrotalus</i>	R					
7+	Dalmatian Pelican	<i>Pelecanus crispus</i>	V			1	V	
8	Scarlet Ibis	<i>Eudocimus ruber</i>		X	X	2		
9	Eurasian Spoonbill	<i>Platalea leucorodia</i>				2(C1)	(E)	
10	Chilean Flamingo	<i>Phoenicopterus chilensis</i>		X	X	2(C1)		
11	Caribbean Flamingo	<i>Phoenicopterus r. ruber</i>		X	X	2(C1)		
12	Waldraap Ibis	<i>Geronticus eremita</i>	E	X	X	1	C	X
13	Little Egret	<i>Egretta garzetta</i>		X		3	C1	
14	Black-necked Swan	<i>Cygnus melanocoryphus</i>			X	2		
15	Black-billed Whistling Duck	<i>Dendrocygna arborea</i>	V	X	X	2	V	E
16	Lesser White-fronted Goose	<i>Anser erythropus</i>	R				V(V)	X
17	Red-breasted Goose	<i>Branta ruficollis</i>	K		X	C1	V(L)	
18	Hawaiian Goose	<i>Branta sandvicensis</i>	V		X	1	V	E X
19	Baikal Teal	<i>Anas formosa</i>	V		X	2	V	V
20	Laysan Teal	<i>Anas laysanensis</i>	R		X	1	V	E
21	Ringed Teal	<i>Anas leucophrys</i>		X	X			V
22	Baer's Pochard	<i>Aythya baeri</i>	V	N/A	N/A		V	V
23	Ferruginous Duck	<i>Aythya nyroca</i>				3	V	
24	Marbled Teal	<i>Marmaronetta angustirostris</i>	V	X	X		V(E)	V
25	Meller's Duck	<i>Anas melleri</i>		X	X		NT	V
26	Garganey	<i>Anas querquedula</i>		X		3	(V)	
27	Red-crested Pochard	<i>Netta rufina</i>			X		(D)	
28	Mandarin Duck	<i>Aix galericulata</i>	K	X	X		NT	
29	Smew	<i>Mergus albellus</i>		X	X		(V)	
30	White-winged Wood Duck	<i>Cairina scutulata</i>	V		X	1	E	C
31	White-headed Duck	<i>Oxyura leucocephala</i>	V	X	X	2	V(E)	V
32	Andean Condor	<i>Vultur gryphus</i>		X	X	1		X
33+	Griffon Vulture	<i>Gyps fulvus</i>			X	2	(R)	X
34	European Black Vulture	<i>Aegypius monachus</i>	V			2	NT(V)	X
35	Secretary Bird	<i>Sagittarius serpentarius</i>				2		
36	Mauritius Kestrel	<i>Falco punctatus</i>	E		X	1	E	X
37*	Crested Caracara	<i>Polyborus pliancus</i>			N/A	2		
38	Red-legged Partridge	<i>Alectoris rufa</i>		X	X		(V)	
39	Rourolou Partridge	<i>Rouleulus rouleou</i>		X	X	3	V	V
40+	Blyth's Tragopan	<i>Tragopan blythii</i>	R	X		1	V	E
41	Satyr Tragopan	<i>Tragopan satyra</i>		X	X	3	NT	V
42	Temminck's Tragopan	<i>Tragopan temminckii</i>			X		NT	
43	Himalayan Monal	<i>Lophophorus impeyanus</i>		X	X	1		
44	Brown-eared Pheasant	<i>Crossoptilon mantchuricum</i>	E		X	1	V	E
45	White-eared Pheasant	<i>Crossoptilon crossoptilon</i>	V		X	1	V	V
46	Golden Pheasant	<i>Chrysolophus pictus</i>		X	X		NT	
47	Lady Amherst's Pheasant	<i>Chrysolophus amherstiae</i>		X	X		NT	
48*	Grey Peacock Pheasant	<i>Polyplectron bicalcaratum</i>			X	C1		
49	Palawan Peacock Pheasant	<i>Polyplectron emphanum</i>	V	X	X	1	E	E
50	Mountain Peacock Pheasant	<i>Polyplectron inopinatum</i>			X	3	V	V
51	Edwards' Pheasant	<i>Lophura edwardsi</i>	V		X	1	C	C
52	Malayan Crestless Fireback	<i>Lophura e. erythrothalma</i>		X		3	V	E
53	Vietnamese Pheasant	<i>Lophura hatinhensis</i>		N/A	N/A		E	C
54	Green Peafowl	<i>Pavo muticus</i>		X		2	V	E
55	Congo Peafowl	<i>Afropavo congensis</i>	K	X	X		V	?
56	Red-crowned Crane	<i>Grus japonensis</i>	V	X	X	1	V	E
57	White-rumped Crane	<i>Grus vipio</i>	V			1	V	E
58	Wattled Crane	<i>Bucconerpes carunculatus</i>	K			2	V	V
59	Demiselle Crane	<i>Anthropoides virgo</i>				2		
60+	Blue Crane	<i>Anthropoides paradisea</i>				2	V	C
61	West African Crowned Crane	<i>Balearica pavonina pavonina</i>		X	X	2		E X
62	Gough Island Moorhen	<i>Gallinula nesiotis</i>	R	X	X		V	
63*	Little Black Bustard	<i>Eupodotis afro</i>			X	2		

The animals are listed in the world-wide standard seven columns. A detailed explanation is at the foot of p37.

MAMMALS STOCKLIST		STOCK			RECEIVED			BORN/H'CH			D.N.S.			DEATHS			DISPOSALS			STOCK					
		31/12/97									30 DAYS			OTHERS						31/12/98					
		M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?
MARSUPIALIA																									
Red-necked Wallaby	<i>Macropus rufogriseus</i>	8	11	0	0	0	0	1	5	4	0	4	2	1	3	0	0	0	0	8	9	2			
Western Grey Kangaroo	<i>Macropus fuliginosus</i>	2	3	0	0	0	0	1	0	2	1	0	0	0	0	0	0	0	0	2	3	2			
CHIROPTERA																									
Rodrigues Fruit Bat	<i>Pteropus rodricensis</i>	19	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	13	0			
Seba's Short-tailed Bat	<i>Carrollia perspicillata</i>	3	5	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5	47 (estimate)			
PRIMATES																									
Slow Loris	<i>Nycticebus coucang</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0			
Ring-tailed Lemur	<i>Lemur catta</i>	12	15	0	0	0	0	3	3	1	0	0	1	0	0	0	1	2	0	14	16	0			
Black and White Ruffed Lemur	<i>Varecia variegata variegata</i>	1	4	0	0	0	0	2	0	1	0	0	1	0	0	0	0	1	0	3	3	0			
Red Ruffed Lemur	<i>Varecia variegata rubra</i>	4	2	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	4	3	0			
Pygmy Marmoset	<i>Callithrix pygmaea</i>	5	2	0	0	0	0	0	0	1	0	0	0	0	0	0	5	2	1	0	0	0			
Silvery Marmoset	<i>Callithrix argentata melanura</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0			
Cotton Top Tamarin	<i>Saguinus oedipus</i>	2	2	1	0	0	0	0	0	2	0	0	0	0	0	0	1	1	0	1	1	3			
White-lipped Tamarin	<i>Saguinus labiatus</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0			
Buffy-headed Capuchin	<i>Cebus apella xanthosternus</i>	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	2			
Colombian Black Spider Monkey	<i>Ateles fusciceps robustus</i>	3	5	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	2	5	1			
Lion-tailed Macaque	<i>Macaca silenus</i>	2	2	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	2	0			
Campbell's Guenon	<i>Cercopithecus campbelli</i>	0	0	0	1	3	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2	0			
Mona Monkey	<i>Cercopithecus mona</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0			
Sulawesi Crested Macaque	<i>Macaca nigra</i>	4	10	0	0	0	0	2	1	1	0	0	0	0	0	0	0	0	0	6	11	1			
Griquet Monkey	<i>Chlorocebus aethiops</i>	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0			
Mandrill	<i>Mandrillus sphinx</i>	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	0			
Chimpanzee	<i>Pan troglodytes</i>	5	23	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	5	23	0			
Bornean Orang utan	<i>Pongo pygmaeus pygmaeus</i>	3	5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	5	0			
Sumatran Orang utan	<i>Pongo pygmaeus abelii</i>	1	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	3	0			
RODENTIA																									
Prairie Marmot	<i>Cynomys ludovicianus</i>	0	0	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70 (estimate)			
African Crested Porcupine	<i>Hystrix cristata</i>	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0			
Capybara	<i>Hydrochaeris hydrochaeris</i>	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0			
Mara	<i>Dolichotis patagonum</i>	0	0	0	4	3	0	0	0	0	0	0	0	1	0	0	0	0	0	3	3	0			
Mountain Viscacha	<i>Lagidium viscaccia</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0			
Red Squirrel	<i>Sciurus vulgaris</i>	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0			
CARNIVORA																									
Maned Wolf	<i>Chrysocyon brachyurus</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0			
Bush Dog	<i>Speothos venaticus</i>	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0			
Coati	<i>Nasua nasua</i>	3	16	0	0	0	0	6	16	0	6	10	0	0	0	0	1	8	0	2	14	0			
Kinkajou	<i>Potos flavus</i>	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0			
Oriental Small-clawed Otter	<i>Aonyx cinerea</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0			
Dwarf Mongoose	<i>Helogale parvula</i>	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0			
Meerkat	<i>Suricata suricatta</i>	1	1	0	1	1	0	0	0	4	0	0	0	1	1	0	0	0	0	1	1	4			
Margay	<i>Felis wiedi</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0			
Jungle Cat	<i>Felis chaus</i>	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0			
Scottish Wild Cat	<i>Felis sylvestrus</i>	1	1	0	0	0	0	2	1	0	0	0	0	1	0	0	2	2	0	0	0	0			
Ocelot	<i>Felis pardalis</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0			
Caracal	<i>Felis caracal</i>	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0			
European Lynx	<i>Felis lynx</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0			
Serval	<i>Felis serval</i>	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0			
Asiatic Lion	<i>Panthera leo persica</i>	2	4	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	4	5	0			
Amur Tiger	<i>Panthera tigris altaica</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0			
Persian Leopard	<i>Panthera pardus saxicolor</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0			
Cheetah	<i>Acinonyx jubatus</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0			
Common Genet	<i>Genetta genetta</i>	1	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	1	4			
PINNIPEDIA																									
Californian Sealion	<i>Zalophus californianus</i>	2	3	0	0	0	0	0	0	2	0	0	2	0	1	0	1	0	0	1	2	0			
PROBOSCIDEA																									
Asiatic Elephant	<i>Elephas maximus</i>	3	6	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	2	6	0			
PERISSODACTYLA																									
Przewalski's Horse	<i>Equus przewalskii</i>	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0			
Common Zebra	<i>Equus burchelli boehmi</i>	2	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	6	0			
Persian Onager	<i>Equus hemionus onager</i>	2	7	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	7	0			
South American Tapir	<i>Tapirus terrestris</i>	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0			
Black Rhinoceros	<i>Diceros bicornis</i>	2	3	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	0	1	4	0			
Indian Rhinoceros	<i>Rhinoceros unicornis</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0			
ARTIODACTYLA																									
Babirusa	<i>Babirusa babirusa</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0			
Guanaco	<i>Lama guanicoe</i>	6	11	0	0	0	0	5	2	0	2	1	0	1	1	0	3	0	0	5	11	0			
Bactrian Camel	<i>Camelus bactrianus</i>	2	2	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	2	2	0			
Chilean Pudu	<i>Pudu pudu</i>	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0			
Axis Deer	<i>Cervus axis</i>	5	14	0	0	0	0	1	3	1	0	2	0	1	0	0	3	8	0	2	7	1			
Barasingha	<i>Cervus duvauceli duvauceli</i>	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0			
Burmese Brow Antlered Deer	<i>Cervus eldi thamin</i>	2	4	1	0	0	0	0	2	1	0	1	0	0	1	0	1	0	0	1	4	2			
Père David's Deer	<i>Elaphurus davidianus</i>	4	7	0	0	0	0	0	2	0	0	0	0	2	1	0	0	0	0	2	8	0			
Reindeer	<i>Rangifer tarandus</i>	3	8	0	1	0	0	3	3	1	3	1	1	0	0	0	1	0	0	3	10	0			
Giraffe	<i>Giraffa camelopardalis</i>	2	4	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	2	4	0			
Nilgai	<i>Boselaphus tragocamelus</i>	3	8	0	0	0	0	2	3	0	0	1	0	1	1	0	2	1	0	2	8	0			
Lowland Anoa	<i>Bubalus depressicornis</i>	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0			
Congo Buffalo	<i>Syncerus caffer nanus</i>	4	7	0	1	0	0	2	1	0	0	0	0	5	0	0	0	0	0	2	8	0			
American Bison	<i>Bison bison</i>	4	9	0	0	0	0	2	2	0	1	2	0	2	0	0	0	0	0	3	9	0			
Bongo																									

BIRDS STOCKLIST

		STOCK 31/12/97			RECEIVED			BORN/H'CH			D.N.S. 30 DAYS			DEATHS OTHERS			DISPOSALS			STOCK 31/12/98		
		M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?
STRUTHIONIFORMES																						
Ostrich	<i>Struthio camelus</i>	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RHEIFORMES																						
Common Rhea	<i>Rhea americana</i>	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CASUARIIFORMES																						
Emu	<i>Dromaius novaehollandiae</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SPHENISCIFORMES																						
Humboldt's Penguin	<i>Spheniscus humboldti</i>	16	15	11	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
PELECANIFORMES																						
White Pelican	<i>Pelecanus onocrotalus</i>	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dalmatian Pelican	<i>Pelecanus crispus</i>	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CICONIIFORMES																						
Little Egret	<i>Egretta garzetta</i>	3	4	0	0	0	0	0	0	3	0	0	3	0	1	0	0	0	0	0	0	0
White Stork	<i>Ciconia ciconia</i>	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black Stork	<i>Ciconia nigra</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waldraup Ibis	<i>Geronticus eremita</i>	9	8	14	0	0	0	0	0	10	0	0	3	0	0	3	0	0	0	6	9	8
Scarlet Ibis	<i>Eudocimus ruber</i>	3	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Eurasian Spoonbill	<i>Platalea leucorodia</i>	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chilean Flamingo	<i>Phoenicopterus chilensis</i>	12	11	20	0	0	0	0	0	8	0	0	1	1	1	1	0	0	0	0	0	0
Caribbean Flamingo	<i>Phoenicopterus ruber ruber</i>	15	12	26	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0
Caribbean x Chilean Flamingo	<i>P. r. ruber x P. chilensis</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANSERIFORMES																						
Fulvous Tree Duck	<i>Dendrocygna bicolor</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-billed Whistling Duck	<i>Dendrocygna arborea</i>	3	2	4	0	0	0	0	0	7	0	0	3	0	0	1	0	0	0	4	3	2
White-faced Whistling Duck	<i>Dendrocygna viduata</i>	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Black-necked Swan	<i>Cygnus melanocoryphus</i>	2	3	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Lesser White-fronted Goose	<i>Anser erythropus</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ross's Snow Goose	<i>Anser rossii</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Goose	<i>Branta ruficollis</i>	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hawaiian Goose	<i>Branta sandvicensis</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Shelduck	<i>Tadorna tadorna</i>	2	4	0	0	0	0	0	0	9	0	0	6	0	0	0	0	0	0	3	2	4
Baikal Teal	<i>Anas formosa</i>	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Falcated Teal	<i>Anas falcata</i>	4	4	0	1	1	0	0	0	5	0	0	0	0	2	0	0	0	0	5	5	3
Northern Shoveler	<i>Anas clypeata</i>	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chilean Pintail	<i>Anas georgica spinicauda</i>	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Shoveler	<i>Anas platylea</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laysan Teal	<i>Anas laysanensis</i>	3	2	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Meller's Duck	<i>Anas melleri</i>	2	3	0	0	0	0	0	0	2	0	0	0	0	0	0	1	2	1	1	1	1
Garganey	<i>Anas querquedula</i>	1	1	0	0	0	0	0	0	5	0	0	4	0	0	1	0	0	0	0	0	0
Chiloe Wigeon	<i>Anas sibilatrix</i>	1	3	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	4	1	4
Ringed Teal	<i>Callonetta leucophrys</i>	2	1	0	0	2	0	0	0	7	0	0	2	0	2	0	0	0	0	5	2	1
Marbled Teal	<i>Marmaronetta angustirostris</i>	2	2	0	2	2	0	0	0	5	0	0	2	0	0	0	0	0	0	2	4	4
Common Eider	<i>Somateria mollissima</i>	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baer's Pochard	<i>Aythya baeri</i>	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ferruginous Duck	<i>Aythya nyroca</i>	3	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tufted Duck	<i>Aythya fuligula</i>	5	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Rosy-billed Pochard	<i>Netta peposaca</i>	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-crested Pochard	<i>Netta rufina</i>	3	3	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Mandarin Duck	<i>Aix galericulata</i>	12	12	0	0	0	0	2	0	6	0	0	0	0	0	0	0	0	0	6	14	12
Carolina Duck	<i>Aix sponsa</i>	4	5	0	0	0	0	1	1	6	0	0	3	1	0	0	0	0	0	3	4	6
White-winged Wood Duck	<i>Cairina scutulata</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Bufflehead	<i>Bucephalus albeola</i>	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
Smew	<i>Mergus albellus</i>	4	3	0	0	0	0	0	0	13	0	0	12	1	1	1	0	0	0	0	0	0
Hooded Merganser	<i>Mergus cucullatus</i>	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ruddy Duck	<i>Oxyura jamaicensis</i>	2	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
White-headed Duck	<i>Oxyura leucocephala</i>	4	2	0	0	0	0	0	0	18	0	0	16	3	2	2	0	0	0	0	0	0
FALCONIFORMES																						
Turkey Vulture	<i>Cathartes aura</i>	2	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
American Black Vulture	<i>Coragyps atratus</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Andean Condor	<i>Vultur gryphus</i>	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Egyptian Vulture	<i>Neophron percnopterus</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Griffon Vulture	<i>Gyps fulvus</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
European Black Vulture	<i>Aegypius monachus</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Secretary Bird	<i>Sagittarius serpentarius</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crested Caracara	<i>Polyborus plancus</i>	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mauritius Kestrel	<i>Falco punctatus</i>	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
GALLIFORMES																						
Grey-headed Chachalaca	<i>Ortalis cinereiceps</i>	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Bare-faced Curassow	<i>Crax fasciolata</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Chinese Painted Quail	<i>Excalfactoria chinensis</i>	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Red-legged Partridge	<i>Alectoris rufa</i>	4	4	0	0	0	0	0	0	11	0	0	0	3	2	11	0	0	0	0	0	0
Rourol Partridge	<i>Rollulus rourol</i>	4	2	0	0	2	0	1	6	4	0	0	0	1	0	0	1	6	0	3	4	4
Blyth's Tragopan	<i>Tragopan blythii</i>	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Satyr Tragopan	<i>Tragopan satyra</i>	3	4	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0
Temminck's Tragopan	<i>Tragopan temminckii</i>	1</																				

		STOCK 31/12/97			RECEIVED			BORN/H'CH			D.N.S. 30 DAYS			DEATHS OTHERS			DISPOSALS			STOCK 31/12/98			
		M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	
Blue Crane	<i>Anthropoides paradisea</i>	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0
West African Crowned Crane	<i>Balearica pavonina pavonina</i>	2	4	0	0	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	2	4	2
Gough Island Moorhen	<i>Gallinula comeri</i>	1	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	1	2	0
Sun Bittern	<i>Eurypyga helias</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
Little Black Bustard	<i>Eupodotis afra</i>	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
CHARADRIIFORMES																							
Stone Curlew	<i>Burhinus oedipnemus</i>	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
Southern Stone Curlew	<i>Burhinus magnirostris</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Crowned Plover	<i>Vanellus coronatus</i>	3	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	1	0
Masked Plover	<i>Vanellus miles miles</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Blacksmiths Plover	<i>Vanellus armatus</i>	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Northern Lapwing	<i>Vanellus vanellus</i>	0	0	10	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5
Golden Plover	<i>Pluvialis apricaria</i>	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
COLUMBIFORMES																							
Speckled Pigeon	<i>Columba guinea</i>	0	0	19	0	0	0	0	0	10	0	0	0	0	0	2	0	0	12	0	0	15	
Rock Dove	<i>Columba livia</i>	3	3	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	2	3	0
Pink Pigeon	<i>Nesoenas mayeri</i>	4	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4	2	0	
Laughing Dove	<i>Streptopelia senegalensis</i>	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Red Turtle Dove	<i>Streptopelia tranquebarica</i>	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Emerald Dove	<i>Chalcophaps indica</i>	2	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
Crested Bronzewing Pigeon	<i>Ocyphaps lophotes</i>	1	1	7	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	1	1	14
Common Bronzewing Pigeon	<i>Phaps chalcoptera</i>	1	2	0	0	0	0	0	2	0	0	2	0	1	0	0	0	0	0	1	1	0	
Diamond Dove	<i>Geopelia cuneata</i>	1	1	2	0	0	0	0	4	0	0	0	0	0	0	0	0	1	0	1	1	5	
Mountain Witch Dove	<i>Geotrygon versicolor</i>	1	1	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0
Mindanao Bleeding Heart Dove	<i>Gallicolumba cringer</i>	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Luzon Bleeding Heart Pigeon	<i>Gallicolumba luzonica</i>	7	4	4	0	0	0	1	1	7	0	0	7	0	1	0	5	2	0	3	2	4	
Jambu Fruit Dove	<i>Ptilinopus jambu</i>	1	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0
Superb Fruit Dove	<i>Ptilinopus superbus</i>	2	1	0	0	0	0	0	0	2	0	0	2	1	0	0	0	0	0	0	1	1	0
Orange-fronted Fruit Dove	<i>Ptilinopus aurantifrons</i>	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Pink-spotted Fruit Dove	<i>Ptilinopus perlatus</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Pied Imperial Pigeon	<i>Ducula bicolor</i>	0	0	1	0	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
Blue Crowned Pigeon	<i>Goura cristata</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Nicobar Pigeon	<i>Caloenas nicobarica</i>	3	5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	4	0
PSITTACIFORMES																							
Red and Blue Lory	<i>Eos histrio</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Black-winged Lory	<i>Eos cyanogenia</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Blue-streaked Lory	<i>Eos reticulata</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Duyvenbode's Lory	<i>Chalcopsitta duivenbodei</i>	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
Yellow-backed Chattering Lory	<i>Lorius garrulus flavopalliat</i>	3	2	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0	1	3	1	0	
Stella's Lorikeet	<i>Charmosyna papou</i>	2	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	2	0	
Musschenbroek's Lorikeet	<i>Neopsittacus musschenbroekii</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Mount Apo Lorikeet	<i>Trichoglossus johnstoniae</i>	2	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0
Palm Cockatoo	<i>Probosciger aterrimus</i>	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0
White-tailed Black Cockatoo	<i>Calyptorhynchus latirostris</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Leadbeater's Cockatoo	<i>Cacatua leadbeateri</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Blue-eyed Cockatoo	<i>Cacatua ophthalmica</i>	8	6	0	2	0	0	2	1	0	0	0	0	0	2	0	3	0	0	9	5	0	
Red-vented Cockatoo	<i>Cacatua haematurropygia</i>	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	
Kea	<i>Nestor notabilis</i>	1	1	0	1	1	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	0	
"Vosmaeri" Eclectus Parrot	<i>Eclectus roratus vosmaeri</i>	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Greater Vasa Parrot	<i>Coracopsis vasa</i>	2	1	0	0	0	0	3	1	0	0	0	0	0	0	0	3	0	0	2	2	0	
Princess of Wales Parakeet	<i>Polytelis alexandrae</i>	2	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	
Splendid Parakeet	<i>Neophema splendida</i>	3	2	0	1	0	0	0	0	0	0	0	0	3	1	0	0	0	0	1	1	0	
Derbyan Parakeet	<i>Psittacula derbiana</i>	5	1	0	0	0	0	0	0	3	0	0	0	2	0	0	0	0	0	3	1	3	
Black-cheeked Lovebird	<i>Agapornis nigrigensis</i>	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	
Hyacinthine Macaw	<i>Anodorhynchus hyacinthinus</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Blue and Yellow Macaw	<i>Ara ararauna</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Blue-throated Macaw	<i>Ara glaucogularis</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Scarlet Macaw	<i>Ara macao</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Red-fronted Macaw	<i>Ara rubrogenys</i>	6	3	0	0	0	0	0	0	2	0	0	0	1	0	0	4	2	0	1	1	2	
Yellow-naped Macaw	<i>Ara auricollis</i>	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	1	0	
Illiger's Macaw	<i>Ara macacana</i>	3	1	0	0	0	0	2	0	0	0	0	0	0	0	0	4	0	0	1	1	0	
Red-masked Conure	<i>Aratinga erythrogenys</i>	3	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	1	0	
Golden-capped Conure	<i>Aratinga auricapilla</i>	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1
Queen of Bavaria Conure	<i>Guaruba guarouba</i>	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
Thick-billed Parrot	<i>Rhynchopsitta pachyrhyncha</i>	2	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2	2	1	
Blue-throated Conure	<i>Pyrrhura cruentata</i>	4	4	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	4	3	1	
Slender-billed Parakeet	<i>Enicognathus leptorhynchus</i>	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	
Yellow-faced Parrotlet																							

		STOCK			RECEIVED			BORN/H'CH			D.N.S.			DEATHS			DISPOSALS			STOCK			
		31/12/97			M F Y/?			M F Y/?			30 DAYS			OTHERS			M F Y/?			31/12/98			
M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?
Black and White Tegu	<i>Tupinambis teguixin</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Desert Monitor	<i>Varanus griseus koniecznyi</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Salvator Monitor	<i>Varanus salvator</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Four Horned Chameleon	<i>Chamaeleo quadricornis</i>	3	6	0	0	0	0	0	0	0	0	0	0	0	3	6	0	0	0	0	0	0	0
SERPENTES																							
Sunbeam Snake	<i>Xenopeltis unicolor</i>	3	2	13	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	2	11
Royal Python	<i>Python regius</i>	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0
Green Tree Python	<i>Chondropython viridis</i>	4	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	2	0
Cuban Boa	<i>Epicrates angulifer</i>	3	2	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	6	2	2	0
Brazilian Rainbow Boa	<i>Epicrates cenchria cenchria</i>	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Jamaican Boa	<i>Epicrates subflavus</i>	1	6	6	0	0	0	0	0	5	0	0	0	0	2	0	0	0	0	0	1	4	11
Rubber Boa	<i>Charina bottae</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Madagascar Boa	<i>Sanzinia madagascariensis</i>	5	4	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	4	4	1
Pacific Boa	<i>Candoia carinata</i>	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0
Boa Constrictor	<i>Constrictor constrictor</i>	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
Green Anaconda	<i>Eunectes murinus</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Honduran Milk Snake	<i>Lampropeltis triangulum</i>	1	3	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	4	2
Central American Indigo Snake	<i>Drymarchoncorais melanurus</i>	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
Indian Cobra	<i>Naja naja</i>	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Green Mamba	<i>Dendroaspis angusticeps</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Gaboon Viper	<i>Bitis gabonica</i>	2	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0
Tropical Rattlesnake	<i>Crotalus durissus colileneatus</i>	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Aruba Island Rattlesnake	<i>Crotalus unicolor</i>	2	3	0	0	0	0	0	0	10	0	0	0	1	0	7	0	0	0	0	1	3	3
		87	148	47	5	7	0	0	0	130	0	0	3	17	34	16	0	0	86	75	121	72	
		267			12			130			3			67			86			268			

Number of specimens 268
Number of species 48

AMPHIBIANS STOCKLIST

		STOCK			RECEIVED			BORN/H'CH			D.N.S.			DEATHS			DISPOSALS			STOCK			
		31/12/97			M F Y/?			M F Y/?			30 DAYS			OTHERS			M F Y/?			31/12/98			
M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?	M	F	Y/?
Smoky Jungle Frogs	<i>Leptodactylus pentadactylus</i>	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
Axolotl (Black Form)	<i>Amblystoma mexicanum</i> aq	0	0	3	0	0	6	0	0	50	0	0	0	0	0	7	0	0	8	0	0	0	44
Axolotl (White Form)	<i>Amblystoma mexicanum</i> aq	0	0	50	0	0	10	0	0	50	0	0	0	0	0	10	0	0	0	0	0	0	100
Japanese Fire-bellied Newt	<i>Cynops pyrrhogaster</i> aq	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Red Eyed Tree Frog	<i>Agalychnis callidryas</i>	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
White's Tree Frog	<i>Litoria caerulea</i>	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	0
Mexican Leaf Frog	<i>Pachymedusa dacnycolor</i>	7	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0
Black and Green Poison Arrow Frog	<i>Dendrobates auratus</i>	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Yellow Striped Poison Arrow Frog	<i>Dendrobates leucomelas</i>	0	0	7	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	22
Golfoducean Poison Arrow Frog	<i>Phyllobates vittatus</i>	0	0	5	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
Argentine Ornate Horned Frog	<i>Ceratophrys ornata</i>	2	2	1	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	1	0	0
African Bullfrog	<i>Pyxicephalus adspersus</i>	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Albino South African Clawed Frog	<i>Xenopus laevis</i> aq	1	1	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	6
Nigerian Clawed Frog	<i>Xenopus tropicalis</i> aq	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Surinam Toad	<i>Pipa pipa</i> aq	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		18	11	105	0	0	22	0	0	115	0	0	0	9	2	20	0	0	8	9	9	214	
		134			22			115			0			31			8			232			

Number of specimens 232
Number of species 15
aq indicates species kept by the Aquarium

FISHES STOCKLIST

		STOCK			STOCK
		31/12/98			31/12/98
OSTEOGLOSSIDAE					
South American Arowana	<i>Osteoglossum bicirrhosum</i>	3			
Black Arowana	<i>Osteoglossum ferreirai</i>	2			
Asiatic Arowana	<i>Scleropages formosus</i>	4			
MORMYRIDAE					
Blunt Jaw Elephant Trunkfish	<i>Gnathonemus elephas</i>	3			
Elephant Trunkfish	<i>Gnathonemus ibis</i>	3			
Long-nosed Elephant Trunkfish	<i>Gnathonemus petersi</i>	12			
Angolan Elephant Trunkfish	<i>Campylomormyrus cassaicus</i>	4			
Down Poker	<i>Campylomormyrus rhynchophorus</i>	4			
Short-nosed Elephant Trunkfish	<i>Marcusenius angolensis</i>	4			
Short-faced Elephant Trunkfish	<i>Mormyrus longirostris</i>	1			
Round-nosed Elephant Trunkfish	<i>Pollimyrus castelnaui</i>	3			
CHARACIDAE					
Blind Cave Fish	<i>Astyanax jordani</i>	50			
Red-eyed Characin	<i>Arnoldichthys spilopterus</i>	3			
Long-finned Characin	<i>Brycinus longipinnis</i>	150			
Cardinal Tetra	<i>Paracheirodon axelrodi</i>	1			
Congo Tetra	<i>Phenacogrammus interruptus</i>	2			
Gold Tetra	<i>Hemigrammus rodwayi</i>	4			
Rummy-nosed Tetra	<i>Hemigrammus bleheri</i>	20			
Emperor Tetra	<i>Nematobrycon palmeri</i>	10			
HEMIODONTIDAE					
Dwarf Pencilfish	<i>Nannostomus marginatus</i>	12			
CYPRINIDAE					
Silver Shark	<i>Balantiochellus melanopterus</i>	7			
Cherry Barb	<i>Capoeta titteya</i>	15			
Goldfish (various)	<i>Carassius auratus</i>	50			
Grass Carp	<i>Ctenopharyngodon idella</i>	4			
Mirror Carp	<i>Cyprinus carpio</i>	5			
Koi Carp	<i>Cyprinus carpio</i>	20			
Omani Blind Cave Fish	<i>Garra barreimiae</i>	85			
Golden Orfe	<i>Idus idus</i>	3			
Cummings Barb	<i>Puntius cummingi</i>	2			
Pla Eesok	<i>Probarbus jullieni</i>	7			
Black Ruby Barb	<i>Puntius nigrofasciatus</i>	50			
Golden Rudd	<i>Scardinius erythrophthalmus</i>	20			
CYPRINODONTIDAE					
Killiefish	<i>Nothobranchius korthausae</i>	Resting eggs only			
Nosy Bé Killiefish	<i>Pachypanchax homalonotus</i>	24			
Killiefish	<i>Pachypanchax sakaramyi</i>	8			
Pike Livebearer	<i>Belonesox belizanus</i>	2			
Butterfly Goodeid	<i>Ameca splendens</i>	180			
Bold Characodon	<i>Characodon audax</i>	30			
Golden Saw-finned Goodeid	<i>Skiffia francesae</i>	150			
Solo Goodeid	<i>Xenoporphus captivus</i>	100			
Crescent Zoe	<i>Zoogoneticus tequila</i>	70			
Swordtail	<i>Xiphophorus clemenciae</i>	20			
Guppy	<i>Poecilia reticulata</i>	250			
HEMIRAMPHIDAE					
Halfbeaks	<i>Nomoramphus ebrardti</i>	50			
Halfbeaks	<i>Nomoramphus ravnaki australe</i>	18			
COBITIDAE					
Clown Loach	<i>Botia macracantha</i>	10			
Dwarf Loach	<i>Botia sidhimunki</i>	10			
ELECTROPHORIDAE					
Electric Eel	<i>Electrophorus electricus</i>	1			
CICHLIDAE					
Triangle Cichlid	<i>Uaru amphiacanthoides</i>	3			
Lake Victoria Cichlid	<i>Haplochromis obliquidens</i>	8			

		STOCK 31/12/98
Lake Victoria Cichlid	<i>Astatoreochromis alluaudi</i>	* 55
Lake Victoria Cichlid	<i>Haplochromis argens</i>	* 70
Lake Victoria Cichlid	<i>Haplochromis pyrrocephalus</i>	* 130
Lake Victoria Cichlid	<i>Haplochromis riponius</i>	* 100
Lake Victoria Cichlid	<i>Haplochromis sauvagei</i>	* 30
Lake Victoria Cichlid	<i>Haplochromis xenognathus</i>	* 90
Otjikoto tilapia	<i>Tilapia guinasana</i>	* 25
Brown Discus	<i>Symphysodon aequifasciata axelrodi</i>	1
Heckel Discus	<i>Symphysodon discus discus</i>	4
Lake Malawi Cichlid	<i>Pseudotropheus elongatus chailosi</i>	* 10
Lake Malawi Cichlid	<i>Cyrtocara moori</i>	2
Lake Malawi Cichlid	<i>Pseudotropheus socofofi</i>	* 80
Lake Malawi Cichlid	<i>Pseudotropheus lombardoi</i>	* 6
Lake Malawi Cichlid	<i>Pseudotropheus sp elongatus ornatus</i>	* 15
Lake Malawi Cichlid	<i>Labidochromis caeruleus</i>	* 12
Lake Malawi Cichlid	<i>Labetropheus fueleborni</i>	* 30
Altum Angelfish	<i>Pterophyllum scalare altum</i>	5
Madagascan Cichlid Frontosa	<i>Ptychochromis 'Côte Est' oligacanthus</i>	12
Frontosa	<i>Cyphotilapia frontosa</i>	2

ANABANTIDAE

Pearl Gourami	<i>Trichogaster leeri</i>	10
Moonlight Gourami	<i>Trichogaster microlepis</i>	2

ATHERINIDAE

Madagascan Rainbow Fish	<i>Bedotia madagascariensis</i>	* 12
Red Rainbow Fish	<i>Glossolepis incisus</i>	* 50
Boeseman's Rainbow Fish	<i>Melanotaenia boesemani</i>	* 150
Lake Tebera Rainbow Fish	<i>Melanotaenia herbertaxelrodi</i>	* 50
Lake Kutubu Rainbow Fish	<i>Melanotaenia lacustris</i>	* 5
Dwarf Rainbow Fish	<i>Melanotaenia praecox</i>	* 3

BAGRIDAE

Giraffe Catfish	<i>Auchenoglanis occidentalis</i>	2
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PIMELODIDAE

Red-tailed Catfish	<i>Phractocephalus hemioliopus</i>	3
Catfish	<i>Leiarus marmoratus</i>	1
Shovel-nosed Catfish	<i>Sorobim lima</i>	1

ICTALURIDAE

Channel Catfish	<i>Ictalurus punctatus</i>	2
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MOCHOKIDAE

Polka-dot Upside-down Catfish	<i>Synodontis angelicus</i>	7
Upside-down Catfish	<i>Synodontis nigriventis</i>	6
Lake Malawi Upside-down Catfish	<i>Synodontis nyassae</i>	4

CALLICHTHYIDAE

Arched Corydoras	<i>Corydoras arcuatus</i>	2
Burgess's Catfish	<i>Corydoras burgessi</i>	6
Panda Catfish	<i>Corydoras panda</i>	* 80
Flag Tail Catfish	<i>Corydoras robiniae</i>	2
Peppered Catfish	<i>Corydoras paleatus</i>	* 15

LORICARIIDAE

Bristlenose Plecostomus	<i>Ancistrus dolichopterus</i>	* 100
Twig Catfish	<i>Fariowella acus</i>	1
Plecostomus Catfish	<i>Hypostomus plecostomus</i>	5
Clown Plecostomus	<i>Peckoltia sp</i>	10
Whiptailed Catfish	<i>Sturisoma aureum</i>	2
Dwarf Sucking Catfish	<i>Otocinclus affinis</i>	4
Angelicus Peckoltia	<i>Peckoltia sp</i>	1
Emperor Peckoltia	<i>Hypancistrus zebra</i>	2

TOXOTIDAE

Archer Fish	<i>Toxotes jaculator</i>	4
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POTAMOTRYGONIDAE

Fresh-water Stingray	<i>Potamotrygon motoro</i>	* 8
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DIPNOI

African Lung Fish	<i>Protopterus annectens</i>	1
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CENTRISCIDAE

Shrimplish	<i>Aeoliscus strigata</i>	2
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SYNGNATHIDAE

Big-bellied Seahorse	<i>Hippocampus abdominalis</i>	* 26
Seahorse	<i>Hippocampus sp</i>	* 250

CENTROPOMIDAE

Giant Glass Fish	<i>Parambassis gulliveri</i>	5
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MONODACTYLIDAE

Mono	<i>Monodactylus argenteus</i>	1
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SCORPAENIDAE

Fumanchu Lionfish	<i>Dendrochirus biocellatus</i>	3
Dwarf Lionfish	<i>Dendrochirus brachypterus</i>	2
White Fin Lionfish	<i>Pterois radiata</i>	2
Leaf Fish	<i>Taenianotus triacanthus</i>	2

SCATOPHAGIDAE

Silver Scat	<i>Selenotoca multifasciata</i>	1
Red Tiger Scat	<i>Scatophagus argus</i>	3

POMACENTRIDAE

Skunk Clown Fish	<i>Amphiprion akallopisos</i>	1
Fire Clown Fish	<i>Amphiprion ephippium</i>	* 5
Tomato Clown Fish	<i>Amphiprion frenatus</i>	2
Common Clown Fish	<i>Amphiprion ocellatus</i>	3
Blue Damsel Fish	<i>Pomacentrus alleni</i>	4

		STOCK 31/12/98
ACANTHURIDAE		
Regal Tang	<i>Paracanthurus hepatus</i>	4
Yellow Tang	<i>Zebrasoma flavescens</i>	1
Sailfin Tang	<i>Zebrasoma veliferum</i>	1

APOGONIDAE

Emperor/Banggai Cardinal Fish	<i>Pterapogon kauderni</i>	* 60
Polka Dot Cardinal Fish	<i>Sphaeramia nematoptera</i>	2

LABRIDAE

Cleaner Wrasse	<i>Labroides dimidiatus</i>	1
Dragon Wrasse	<i>Novaculichthys taeniourus</i>	1

SCARIDAE

Bicolour/Clown Parrotfish	<i>Cetoscarus bicolor</i>	1
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GobiIDAE

Peacock Goby	<i>Tateurndina ocellicauda</i>	* 50
Yellow Coral Goby	<i>Gobiodon okinawae</i>	1

POMACANTHIDAE

Koran Angelfish	<i>Pomacanthus semicirculatus</i>	1
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ANTHIINAE

Lyre-tail Coralfish	<i>Anthias squamipinnis</i>	1
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TOTAL

3163

Number of specimens 3163

Number of species 129

* denotes species bred in 1998

INVERTEBRATES STOCKLIST

		STOCK 31/12/98
ARACHNIDS		
Chilean Rose Tarantula	<i>Phrixotrichus cala</i>	* 2
Mexican Red-knee Tarantula	<i>Euatalus smithii</i>	* 12

INSECTS

Jungle Nymph	<i>Heteropryx dilitata</i>	* 40 +
Stick Insect	<i>Baculum extrudentum</i>	* 200 +
Spiny Stick Insect	<i>Eurycantha calcarata</i>	* 200 +
Macleay's Spectre	<i>Extastoma tiaratum</i>	* 150 +
Fruit Beetle	<i>Pachnoda sp</i>	* 100 +
Assassin Bug	<i>Platymerus biguttata</i>	25 +

MOLLUSCS

African Land Snail	<i>Achatina fulica</i>	2
Partula Snail	<i>Partula mirabilis</i>	* 17
Partula Snail	<i>Partula taeniata</i>	* 467
Partula Snail	<i>Partula varia</i>	* 13
Conch	<i>Fusinus polygonoides</i>	aq 1

COELENTERATES

Star Coral	<i>Favia sp</i>	aq 2
Frog Spawn Coral	<i>Euphyllia divisa</i>	aq 3
Sea Anemone	<i>Heteractis sp</i>	aq* 4
Sand Anemone	<i>Phymanthus crucifer</i>	aq 1
Leather Coral	<i>Sarcophyton trocheliophorum</i>	aq* 4
Soft Coral	<i>Xenia sp</i>	aq* 2
Zoanthid Colony	<i>Zoanthid sp</i>	aq* 4
Soft Coral	<i>Sinularia sp</i>	aq* 31
Soft Coral	<i>Cladiella sp</i>	aq* 1
Brain Coral	<i>Trachyphyllia geofroyi</i>	aq* 2
Mushroom Anemones	<i>Actinodiscus sp</i>	aq* 80
Mouse Ear Coral	<i>Lobophytum crassum</i>	aq* 3
Encrusting Anemone	<i>Palythoa sp</i>	aq* 3
Bowl Coral	<i>Turbinaria pelata</i>	aq 1
Mushroom Coral	<i>Fungia actiniformis</i>	aq 1
Wonder Coral	<i>Catalaphyllia sp</i>	aq 1

CRUSTACEANS

White-clawed Crayfish	<i>Austropotamobius pallipes</i>	aq 4
Tadpole Shrimp	<i>Triops cancriformis</i>	aq Resting
eggs only		

ECHINODERMS

Long Spined Urchin	<i>Diadema antillarum</i>	aq 7
Red Pencil Urchin	<i>Heterocentrotus mammillatus</i>	aq 2
Slate Pencil Urchin	<i>Eucidaris tribuloides</i>	aq 1
Serpent Starfish	<i>Ophiolepis superba</i>	aq 1
Green Brittle Starfish	<i>Ophiarachna incrassata</i>	aq* 20

TOTAL

1407

Number of specimens 1407

Number of species 36

* indicates species bred in the Society's collection in 1998

aq indicates species kept by the Aquarium

STANDARD SEVEN COLUMN TEXT LISTINGS, pp32-37

- Col 1 - Beginning year stock, normally agrees with end 1997.
Minor adjustments from re-sexing and detection of minor errors.
- Col 2 - Stock that has come to the collection from outside sources.
- Col 3 - This is the addition to our stocks through breeding.
- Col 4 - Stock bred in the Zoo which did not survive more than 30 days. Although col 3/4 are appropriate for breeding performance of many species, they are inappropriate for those with large numbers of small/microscopic young, most of which are unlikely to survive until they are of countable size. For these, col 4 is ignored, and only countable survivors shown in col 3.
- Col 5 - Animals which died or were humanely destroyed for reasons of ill-health.
- Col 6 - Animals removed from the collection other than for reasons in Col 5 above.
- Col 7 - Closing stock as at 31st Dec 1998.
- In each column known males are shown 'M', females 'F' and as yet unsexed/young are shown 'Y/?'

DIRECTOR'S DEPARTMENT
Director of Chester Zoo and Chief Executive
Professor Gordon McGregor Reid, BSc, PhD, CBiol, FIBiol

Director's Assistant and Oakfield House Manager
Julie Croucher, Dip Anim Mgt, AIQPS

Personnel Manager
Jayne Quinn, BA, PG Dip HRM, Dip RSA, MIPD

Security Officer
Marc Boardman

FINANCE AND ADMINISTRATION DIVISION
Financial Controller and Head of Division
Michael Johnson, MA, FCA, FCMA, MIMC

Deputy Financial Controller
Alan Sykes, FCA, Dip BA

Divisional Secretary
Pauline McKee

IT Systems Supervisor
Philip Morris, HNC, Dip AMITA

Assistant Security Officers
Mervyn Garside
Bruce West +

Accounts Supervisor
Carol Campion

Accounts and Cashiers
Julie Bird
Chris Capner
Sue Davies
Sylvia Delves *
Joyce Lucas □
Elaine Mulreay *
Carmel Pearson
Lorraine Richardson
Barbara Stewart*

Development Manager
John Regan, BA, MA, MICFM

Membership Secretary
Maureen Allsopp

Adoptions Secretary
Mary McManus
(resigned Jan 1999)

Stores and Gatehouse Manager
Peter Thompson +

Store Keepers
Mark Fallon +
John Green +
Brendan O'Brien+

Telephonists
Carol Karim *
Marie Lewis
Eunice Manning

Timekeepers
Mark Fallon +
John Green +
Peter Hutchins +
Brendan O'Brien+

Office Cleaner
Sue Read +

Volunteer Disabilities Awareness Advisor
Michael Elkerton

EDUCATION DIVISION
Head of Education Services and Head of Division
Stephen McKeown, BSc, PGCE

Divisional Secretary
Teresa Gibson, BA

Librarian
Jane Woodward, BA, ALA*

Administration and Teachers
Dominic Briffa, BSc, PGCE
Linda Davenport, LLB
Teresa Gibson, BA
Paul Kitching, BSc, PGCE

Mark Powleson, BA
Sara Ruks, BSc, PGCE
Gill Waters, Cert Ed □

Interpretation Consultant
Ian Hughes*

Volunteers

Prof Ron Ackroyd
PhD, DEng, FIEE
Thelma Ackroyd
Olga Adderton
Mary Ball
Julie Bates
Margaret Bell
Cynthia Bergstrand
Jane Bie
Stuart Booth
Carole Bowness
Violet Brickland
Eric Chesworth
Doreen Coulson
Janis Coulson
Brain Cox
Margaret Cox
Colin Davies
Shirley Davies
Margaret Dromgoole
Peter Duxbury
Hazel Edwards BSc, PGCE
Squadron Leader Will Edwards RAF (retd)
Bett Ellwood
Mavis Fazey
Michael Fieldhouse
Dorothea Fisher
Bill Fletcher
Margaret Fletcher
Tracey Green
Annabelle Grey
Bill Hanks
Gill Hanks
Heather Harrison
Rose Harrison
Janet Henderson
Di Holbrook
Neil Holbrook
Margaret Horswill
Don Howard
Beryl Howard
Geoffrey Knapp
Trudy Knight
Annette Latham
Anne Lighten
Margaret Lister
Bill Longworth
Iris Markham
Joan Mead
Ian Mellor
Maureen Miles
Alice Milner
Bill Milner

Sarah Molyneux
Pam Morrey
Jean Needham
Mollie Nevell
Joan Norman
Ian Ogden
Evelyn Parkinson
Brenda Passey
Eileen Perry
June Potter
Sheila Price, MBE
Vicky Pugh
Margaret Rushton
Allan Saxton
Jean Schofield
Edna Scovell
Jean Seddon
Glenys Sherwin
Margaret Shilliday
Joan Springett
Neil Stuart
Debbie Tatum
Geoffrey Taylor
Ivy Thompson
Keith Thompson
Alison Todd
Debbie Tong
Ann Turley
Vikki Turtle
Dennis Vickers
Derenda Walters
Maurice Whitehead
Alan Whitwell
Stella Wilkinson
Noel Williams

General Curator: Higher Vertebrates and Research Co-ordinator
Dr Roger Wilkinson, BSc, PhD

General Curator: Operations
Mark Pilgrim, BSc

General Curator: Lower Vertebrates and Invertebrates
Vacant

General Curator: Animal Supplies and Safety (Resigned February 1999)
Nicholas Ellerton

Registrar
Penny Rudd, BA, Dip RSA

Projects Manager
Neil Spooner

Health and Safety Officer
Don Dinning *+

Veterinary Laboratory Technician
Gail Mills, BSc

Student Co-ordinator
Alan Woodward, Dip Anim Mgt +

Keeping Staff
James Andrewes
Lois Bassett, BSc
Shane Blake
Jason Boyer □
Nigel Brooks
Dave Brunger, Dip Anim Mgt
Mark Cleave, Dip Anim Mgt

Karen Davies
Joyce Dodd
John Frost, Dip Anim Mgt
Dave Hall
Geoff Harper, Dip Anim Mgt
Paul Howse, BA, Dip Anim Mgt
Richard Hughes, BA
Mick Jones
Darren Langford, Dip Anim Mgt
Carl Laven
Chris Lavender
Andrew Lenihan
Alan Littlehales
Leanne Lowton
Chas MacKenzie, Dip Anim Mgt
Wayne McLeod
Catherine McLoughlin, Dip Anim Sci
Simon Marsh □
Nick Manning
Phil Molyneux, Dip Anim Mgt
Anne Morris
Paul Morris, Dip Anim Mgt
Fiona Nelson, BSc *
Niall Ormerod
Ray Packwood, Dip Anim Mgt
Don Plant □
Beryl Ramsay
Allan Reid, Dip Anim Mgt, SVQ3
Tim Rowlands
Don Stevenson □
James Thwaite, BSc, Dip Amin Mgt
Bruce West, Dip Anim Mgt+
Phil Whalley, Dip Anim Mgt
Steve Williams, Dip Anim Mgt
John Willis
Alan Woodward, Dip Anim Mgt +
Andrew Woolham
Chris Yarwood, Dip Anim Mgt

Assistant Curator: Herpetology
Vacant

Herpetologist (Resigned January 1999)
Keith Brown

Acting Herpetologist
Isolde McGeorge

Herpetology Keeping Staff
Sara Cocks, BSc
John Wilkinson *

Assistant Curator: Aquarium
Vacant

Aquarist
Mike Crumpler

Aquarium Keeping Staff
Justin Bell, Dip Anim Mgt
Gary Dodd

Presenters
Fiona Angwin *□
Vicky Powell □

Animal Supplies Manager
Anthony Hutchinson

Animal Supplies Staff
Leigh Jones
Ken Newey
Mervyn Ranasinghe

Pest Controller
Colin Humphries *

ESTATES AND GARDENS DIVISION
Estate Engineer and Head of Division
Steve O'Brien, HNC

Divisional Secretary
Barbara Williams, HNC □

Temporary Project Engineer
Keith Woods, HNC, MBIAT □

CAD Technician
Paul Evans, BSc, HNC□

Maintenance Foreman
Ray Morrison

Planning Supervisor
Peter Owens

Maintenance
Ian Blythe
Chris Bridges
Dave Holder
Denis Kinsella
Anthony Lennon
Paul Lindop
Bernard McCone
Kevin McDonagh
Richard Read
George Scott
Jason Spencer
Nick Young

Head Groundsman
Peter Hughes

Groundstaff
Hazel Dean
Stephen Gilyeat
Ray Head
Mark Hughes
Peter Hutchins +
Sandra Jebb
Cyril Jones
Malcolm Lloyd
George O'Connor
Peter Powell
Sue Read +

Curator of Botany and Horticulture (from Jan 1999)
Mark Sparrow, Kew
Dip Hort, CGLI Hort

Acting Head Gardener
John Johnson

Foreman Gardener
Chris Williams, CGLI Hort

Gardeners
Keith Done
Robert Duncan, NVQ2
Barry Grain, NVQ2 □
Mark Hargreaves, NVQ2
Paul Harrison, NVQ2
Gwyn Hewitt, NVQ2
Richard Hoddinott, NVQ3
Paul Leach, NVQ2
Al Millington, NVQ2
Ray Newey
John Richardson, NVQ2
Steve Rowland □
Nigel Wood, NVQ2

Transport and Plant Engineer
Peter Bartley, HNC

Plant and Equipment
Brian Goss

Railway and Boats
Darren Paech
Peter Quayle
Derek Toms

MARKETING DIVISION
Marketing Manager and Head of Division
Chris Vere, MBE, TD, MA

Public Relations Officer
Pat Cade, MIPR

Group Sales Manager
Jane Lawson

Group Sales Assistant
Taj Pinder *

Oakfield & Functions Manager
Richard Casson Δ

Oakfield & Functions Assistant Manager
Richard Jobson, BA Δ

Oakfield Chef
Liam Adamson Δ

Second Chef
Darren Davis Δ

General Catering Manager
Sue Clews Δ

Assistant Catering Manager
Brian Lloyd Δ

Chef Supervisor
Ian Patten Δ

Catering Supervisors
Johanna Glossop Δ
Phyllis Keay Δ
Debbie McLeod Δ

Staff Canteen Supervisor
Barbara Smith Δ

General Catering
Jeanette Barlow Δ
Jo-Anna Birmingham Δ
Andrew Burton, BSc Δ
Jonathan Humphreys
NVQ 2 Δ
Jeanette Hutchinson Δ
Dee Jones Δ
Darren Keay * Δ
Mark Ormerod Δ
Tracey Pleavin Δ

Retail Sales Manager
Alan Jones

Assistant Retail Sales Manager
Susanne Stanton

Buyer and Merchandise Controller
Wendy Locker

Buyer and Retail Supervisor
Celia Long

Retail Sales Assistants
Janet Aldis
Rachel Bestwick
Brenda Jones
Danny Reading
Gaynor Robinson
Bill Robson
Alison Taylor*

1997 STAFF ASSOCIATION
Committee Chairman and Retail and Catering
Celia Long

Vice Chairman and Keepers
Andrew Lenihan

Gardens and Groundstaff
Paul Harrison

Keepers
Sarah Cocks

Maintenance
Paul Lindop

Education and Administration
Mark Powleson

COMMITTEE OF REPRESENTATIVES OF EMPLOYEE SAFETY (CRES)
Committee Chairman
Susanne Stanton

Members
Mark Cleave
Brian Lloyd
Mary McManus
Ray Morrison
Mark Pilgrim
Chris Williams

JOB RELATIVITY COMMITTEE
Chris Capner
Andrew Lenihan
Celia Long
Bernard McCone
Chas MacKenzie
Steve O'Brien
Mark Pilgrim
Jayne Quinn

RETIRED - 1998
Peter Braithwaite
Ken Roberts
Eric Rudman

STAFF LEAVING IN 1998/99
Keith Brown
Stuart Davies
Wendy Davies
David Dawbin
Heather Dibb
Nicholas Ellerton
Lorraine Ellison
Andrew Foxall
Steve Hogarth
Mary McManus
Roger Merry
Steve Newey
Helen Smith
Sue Thomas
Lynn Wilkinson
Scott Wilson

* denotes Part-time
+ denotes Dual Responsibilities
□ denotes Short Term Contract
Δ denotes Occupational Training Certification

Professor Gordon McGregor Reid, Zoo Director

- President, British Cichlid Association
- Visiting Professor, Department of Veterinary Clinical Science and Animal Husbandry, University of Liverpool
- Chairman, Advisory Group, Committee for Recently Extinct Organisms (CREO) American Museum of Natural History, New York
- Member of Council of The Federation of Zoological Gardens of Great Britain and Ireland and Membership and Licensing Committee
- Member of Council, The Linnean Society of London
- Member of Council and Conservation Committee, Fauna and Flora International
- Member of Conservation Breeding Specialist Group, Species Survival Commission, World Conservation Union (IUCN)
- Member of Fish Specialist Group, Species Survival Commission, World Conservation Union (IUCN)
- Member of the Joint Management of Species Committee, The Federation of Zoological Gardens of Great Britain and Ireland
- Member of Research Committee, European Association of Zoos and Aquaria (EAZA)
- Member of European Union of Aquarium Curators
- Member of the World Zoo Organisation/International Union of Directors of Zoological Gardens (IUDZG/WZO) and Chair WZO Marketing Group
- Member of the Council, Association of Leading Visitor Attractions (ALVA)

Chris West, Chief Curator

- Visiting Lecturer, Department of Veterinary Clinical Science and Animal Husbandry, University of Liverpool
- Member of World Conservation Union (IUCN) UK Committee

Julie Croucher, Director's Assistant

- Chairman of Council, Association of British Wild Animal Keepers (ABWAK)

**Dr Roger Wilkinson,
General Curator: Higher Vertebrates and
Research Co-ordinator**

- Honorary Research Fellow, University of Keele
- Member of Council, Avicultural Society
- Scientific Advisor to the World Parrot Trust
- Member of British Ornithologist's Union Records Committee
- Member of the Joint Management of Species Committee, The Federation of Zoological Gardens of Great Britain and Ireland
- Member of Pheasant Specialist Group (IUCN/Birdlife International/WPA)
- Member of Committees of the World Pheasant Association and the Congo Peafowl Trust
- Secretary to the West African Ornithological Society

- Member of Research Group, The Federation of Zoological Gardens of Great Britain and Ireland
- Member of Cheshire Wildlife Trust Barn Owl Group

**Nicholas Ellerton,
General Curator: Animal Supplies and Safety**

- Member of the Captive Care Committee, Primate Society
- Member of Joint Management of Species Committee, The Federation of Zoological Gardens of Great Britain and Ireland
- Member of the Asiatic Elephant Specialist Group
- Member of Cheshire Agenda 21 Environmental Forum
- Chair of the Fauna and Flora International North West Group

Penny Rudd, Registrar

- Member of Reaseheath College of Agriculture's Animal Care Course Industrial Liaison Group
- Secretary/Co-ordinator of the Fauna and Flora International North West Group
- Member of the Liverpool University/Chester College Steering Group for BSc in Animal Behaviour and Welfare
- Harvest Mouse Co-ordinator for Cheshire Wildlife Trust

Jayne Quinn, Personnel Manager

- Member of the Advisory, Conciliation and Arbitration Service (ACAS) Chester Personnel Group

Chris Vere, Marketing Manager

- Member of the Marketing and Benchmarking Committees, Association of Leading Visitor Attractions (ALVA)
- Joint Secretary, *Favourite Days Out* Tourist Consortium Group
- Committee Member, Chester (Hapsford) M 56 Tourist Information Centre Steering Group

Pat Cade, Public Relations Officer

- Alternate Member of Council, Association of Leading Visitor Attractions (ALVA)
- Member of Marketing and PR Committee, The Federation of Zoological Gardens of Great Britain and Ireland
- A Director of the North West Tourist Board
- Joint Secretary, *Favourite Days Out* Tourist Consortium, and representative on the Chester Tourism Liaison Group and Chester/Cheshire Conferences Committee

Stephen McKeown, Head of Education Services

- Member of the Executive Committee, International Association of Zoo Educators
- Chairman of the Education Committee, Federation of Zoological Gardens of Great Britain and Ireland
- Member of Council, Federation of Zoological Gardens of Great Britain and Ireland
- Member, Educational Employer's Liaison Group, Manchester Metropolitan University

In addition to those listed above, several staff are Chairs or members of Taxon Advisory Groups (TAGs) and co-ordinators of European Endangered Species Programmes (EEPs), Joint Management of Species Programmes (JMSPs) or other conservation groups (See Conservation Co-ordination report page 40).

TAXON ADVISORY GROUP CHAIRS

Chester Zoo provides Chairs at a high level of conservation management and co-ordination to lead four key Zoo Federation Taxon Advisory Groups (TAGs), as members of the Zoo Federation Joint Management of Species Group (JMSG) for Great Britain and Ireland. In some cases the responsibilities of the Chair extend into continental Europe, as with the endangered species programme or EEP's organised by the European Association of Zoos and Aquaria (EAZA) or comparable programmes organised by the European Union of Aquarium Curators (EUAC).

Taxon

Elephants (JMSG)
Deer (EEP)
Parrots (EEP, JMSG)
Fish and Aquatic Invertebrates (EEP/EUAC/JMSG)

Chair

Nicholas Ellerton
Nicholas Ellerton (Co-chair)
Dr Roger Wilkinson
Prof Gordon McGregor Reid (Co-chair)

BREEDING PROGRAMME CO-ORDINATORS

Chester Zoo is an active participant in 15 national Federation Joint Management of Species Programmes (JMSPs) and international European Endangered Species Programme (EEP) studbooks and registers for the co-ordination of breeding programmes within Taxon Advisory Groups (TAGs).

Species

Chimpanzee (JMSP)
De Brazza Monkey (JMSP)
Talapoin Monkey (JMSP)
Gemsbok (JMSP)
Palm Cockatoo (EEP)
Blue-eyed Cockatoo (European Stud Book)
West African Crowned Crane (UK Co-ordinator)
Green-cheeked Amazon Parrot (EEP)
Lilacine Amazon Parrot (EEP)
Cuban Amazon Parrot (JMSP)
African Cichlid Fishes Conservation Group (EUAC/FAITAG)
Mexican Livebearers Conservation Group (EUAC/FAITAG)
Coral Conservation Group (EUAC/FAITAG)
Tadpole Shrimp Conservation Group (EUAC/FAITAG)
Native Crayfish Conservation Group (EUAC/FAITAG)

Co-ordinator

Nicholas Ellerton
David Brunger
David Brunger
Charles McKenzie
Dr Roger Wilkinson
Dr Roger Wilkinson
Dr Roger Wilkinson
Mark Pilgrim
Mark Pilgrim
Mark Pilgrim
Justin Bell
Justin Bell assisting Dr Peter Burgess
Justin Bell assisting John Jarvis
Ian Hughes
Ian Hughes



Success for the Elephants TAG with successful rearing of female Asiatic elephant calf *Sithami*



Michael Jones

Further success for the Elephants TAG with female Asiatic elephant calves *Tara* and *Karishma* born at Twycross Zoo after successful matings at Chester



Fish and Aquatic Invertebrates Taxon Advisory Group second international meeting at Chester (Europe, USA)

EIGHTEEN RESEARCH/CONSERVATION PROJECTS INVOLVING CHESTER ZOO
(Supervisor/Coordinators indicated in brackets, if applicable)

SUBJECT	RESEARCHER/ COORDINATOR	QUAL	FUNDING/ SUPPORTING BODY	COLLABORATING BODY
Chimpanzee behavioural study in Gashaka Gumti, Nigeria	Vacant (C West)		World Wide Fund for Nature (UK) & NCF	WWF & Nigerian Conservation Foundation / Manchester Metropolitan University (Dr B Stevens-Wood) Researcher relocated. Project on-hold
Conservation biology & behavioural ecology	J Bell	MSc	NEZS/MMU	Manchester Metropolitan University (Dr B Stevens-Wood)
Taxonomic/conservation evaluation of rare Amazonian Parrots	M Pilgrim (Dr R Wilkinson)	PhD	NEZS/ Amazona Society	Liverpool John Moores University (Dr M Willcox <i>et al.</i>)
Rodrigues Fruit Bat Research	F Nelson	PhD	NEZS	University of Liverpool, Leahurst
Ruffed Lemur Research	J Thwaite	MSc	NEZS	University of Liverpool
Behaviour and ecology of Helmet Shrikes in Zambia	R Stjernstedt (R Wilkinson)	PhD	NEZS/MMU	Manchester Metropolitan University (Dr C Goldspink)
Status and taxonomy of eretmodine cichlid fish of Lake Tanganyika	S Wheeler (Prof G Reid)	PhD	LJMU	Liverpool John Moores University (Dr P Oakland)
Genome Resource Bank Cryobiology project.	Prof G Reid	Post Doctoral Research	EU Biotechnology grant	University of Stirling, Scotland/FAO, Rome (Dr K Rana) and Institute of Zoology, London (Dr W Holt) Phase 2 completed in 1997 SCARCE initiative commenced 1998
Microsatellite DNA in determining parentage	Prof G Reid	Post Graduate Research	Fisheries Society of Great Britain	London Zoo Aquarium (Dr H Hall)
Zoogeography and eco-region studies, Africa	Prof G Reid		NEZS/ WWF (International)	WWF (International), WWF (UK), Nigerian Conservation Foundation, Nigerian Field Society and other partners
Gashaka Gumti Fish Survey	J Bell (Prof G Reid)		NEZS/WWF/NCF	Financial support and staff involvement
Tadpole Shrimp and Crayfish Species Recovery Programmes, UK	M Crumpler/ J Bell Aquarium Dept		English Nature/ NEZS	English Nature and Zoo Federation Fish and Aquatic Invertebrate Taxon Advisory Group (I Hughes)
Sand Lizard Species Recovery Programme, UK	Reptile Dept (Prof G Reid)		English Nature/ CCW/WWF(UK)	English Nature with Herpetological Conservation Trust, Sefton Rangers, Cheshire Wildlife Trust, Countryside Council for Wales and WWF (UK)
Harvest Mouse Conservation Programme, UK	P Rudd		Cheshire Wildlife Trust/NEZS	British Museum of Natural History, New Forest Quest, Vincent Wildlife Trust and others
Conservation projects, Mexico	Prof G Reid		NEZS	Advice and support to Consortium of Mexican Universities (T Contreras MacBeath, Dr E Dias Pardo, Dr R Pineda Lopez, Dr M Carmen Uribe)
Blue-eyed Cockatoo Field Study	(J Pilgrim) (Dr R Wilkinson) (Dr S Marsden)		NEZS/private donation	Manchester Metropolitan University
Avian Parasites	Dr S Cork (C West)	Post-doctoral research		Harper Adams College
Ecological Survey of Zoo Land	C West		NEZS	Cheshire Wildlife Trust (C Mahon)

TAXON ADVISORY GROUP CHAIRS

Chester Zoo provides Chairs at a high level of conservation management and co-ordination to lead four key Zoo Federation Taxon Advisory Groups (TAGs), as members of the Zoo Federation Joint Management of Species Group (JMSG) for Great Britain and Ireland. In some cases the responsibilities of the Chair extend into continental Europe, as with the endangered species programme or EEP's organised by the European Association of Zoos and Aquaria (EAZA) or comparable programmes organised by the European Union of Aquarium Curators (EUAC).

Taxon

Elephants (JMSG)
Deer (EEP)
Parrots (EEP, JMSG)
Fish and Aquatic Invertebrates (EEP/EUAC/JMSG)

Chair

Nicholas Ellerton
Nicholas Ellerton (Co-chair)
Dr Roger Wilkinson
Prof Gordon McGregor Reid (Co-chair)

BREEDING PROGRAMME CO-ORDINATORS

Chester Zoo is an active participant in 15 national Federation Joint Management of Species Programmes (JMSPs) and international European Endangered Species Programme (EEP) studbooks and registers for the co-ordination of breeding programmes within Taxon Advisory Groups (TAGs).

Species

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De Brazza Monkey (JMSP)
Talapoin Monkey (JMSP)
Gemsbok (JMSP)
Palm Cockatoo (EEP)
Blue-eyed Cockatoo (European Stud Book)
West African Crowned Crane (UK Co-ordinator)
Green-cheeked Amazon Parrot (EEP)
Lilacine Amazon Parrot (EEP)
Cuban Amazon Parrot (JMSP)
African Cichlid Fishes Conservation Group (EUAC/FAITAG)
Mexican Livebearers Conservation Group (EUAC/FAITAG)
Coral Conservation Group (EUAC/FAITAG)
Tadpole Shrimp Conservation Group (EUAC/FAITAG)
Native Crayfish Conservation Group (EUAC/FAITAG)

Co-ordinator

Nicholas Ellerton
David Brunger
David Brunger
Charles McKenzie
Dr Roger Wilkinson
Dr Roger Wilkinson
Dr Roger Wilkinson
Mark Pilgrim
Mark Pilgrim
Mark Pilgrim
Justin Bell
Justin Bell assisting Dr Peter Burgess
Justin Bell assisting John Jarvis
Ian Hughes
Ian Hughes



Success for the Elephants TAG with successful rearing of female Asiatic elephant calf *Sithami*



Michael Jones

Further success for the Elephants TAG with female Asiatic elephant calves *Tara* and *Karishma* born at Twycross Zoo after successful matings at Chester



Fish and Aquatic Invertebrates Taxon Advisory Group second international meeting at Chester (Europe, USA)

EIGHTEEN RESEARCH/CONSERVATION PROJECTS INVOLVING CHESTER ZOO
(Supervisor/Coordinators indicated in brackets, if applicable)

SUBJECT	RESEARCHER/ COORDINATOR	QUAL	FUNDING/ SUPPORTING BODY	COLLABORATING BODY
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Rodrigues Fruit Bat Research	F Nelson	PhD	NEZS	University of Liverpool, Leahurst
Ruffed Lemur Research	J Thwaite	MSc	NEZS	University of Liverpool
Behaviour and ecology of Helmet Shrikes in Zambia	R Stjernstedt (R Wilkinson)	PhD	NEZS/MMU	Manchester Metropolitan University (Dr C Goldspink)
Status and taxonomy of eretmodine cichlid fish of Lake Tanganyika	S Wheeler (Prof G Reid)	PhD	LJMU	Liverpool John Moores University (Dr P Oakland)
Genome Resource Bank Cryobiology project.	Prof G Reid	Post Doctoral Research	EU Biotechnology grant	University of Stirling, Scotland/FAO, Rome (Dr K Rana) and Institute of Zoology, London (Dr W Holt) Phase 2 completed in 1997 SCARCE initiative commenced 1998
Microsatellite DNA in determining parentage	Prof G Reid	Post Graduate Research	Fisheries Society of Great Britain	London Zoo Aquarium (Dr H Hall)
Zoogeography and eco-region studies, Africa	Prof G Reid		NEZS/ WWF (International)	WWF (International), WWF (UK), Nigerian Conservation Foundation, Nigerian Field Society and other partners
Gashaka Gumti Fish Survey	J Bell (Prof G Reid)		NEZS/WWF/NCF	Financial support and staff involvement
Tadpole Shrimp and Crayfish Species Recovery Programmes, UK	M Crumpler/ J Bell Aquarium Dept		English Nature/ NEZS	English Nature and Zoo Federation Fish and Aquatic Invertebrate Taxon Advisory Group (I Hughes)
Sand Lizard Species Recovery Programme, UK	Reptile Dept (Prof G Reid)		English Nature/ CCW/WWF(UK)	English Nature with Herpetological Conservation Trust, Sefton Rangers, Cheshire Wildlife Trust, Countryside Council for Wales and WWF (UK)
Harvest Mouse Conservation Programme, UK	P Rudd		Cheshire Wildlife Trust/NEZS	British Museum of Natural History, New Forest Quest, Vincent Wildlife Trust and others
Conservation projects, Mexico	Prof G Reid		NEZS	Advice and support to Consortium of Mexican Universities (T Contreras MacBeath, Dr E Dias Pardo, Dr R Pineda Lopez, Dr M Carmen Uribe)
Blue-eyed Cockatoo Field Study	(J Pilgrim) (Dr R Wilkinson) (Dr S Marsden)		NEZS/private donation	Manchester Metropolitan University
Avian Parasites	Dr S Cork (C West)	Post-doctoral research		Harper Adams College
Ecological Survey of Zoo Land	C West		NEZS	Cheshire Wildlife Trust (C Mahon)

EXTERNAL RESEARCH/CONSERVATION OUTREACH: SIXTEEN PROJECTS SUPPORTED BY CHESTER ZOO

SUBJECT	COORDINATOR(S)/CONTACTS	FUNDING/SUPPORTING	BODY COLLABORATING BODY
Support <i>in situ</i> for Zoo Outreach, India	Dr R Wilkinson	NEZS BAANC	CBSG / Zoo Outreach India (Dr S Walker)
Conservation Breeding Specialist Group (IUCN/SSC/CBSG)	Prof G Reid / Animal Division	NEZS	Financial Support from NEZS as one of many contributing zoos to <i>in situ</i> projects worldwide
Philippine Spotted Deer Recovery Programme, West Visayas	Dr R Wilkinson	NEZS FFI	Financial Support <i>in situ</i> with Mulhouse Zoo, Melbourne Zoo, Berlin Zoo
World Parrot Trust	Dr R Wilkinson	NEZS / World Parrot Trust	Financial support from NEZS through interpretation display and collection box
Avian skull studies, UK	J C Waive (Veterinarian)	NEZS	Materials supplied for study published in the <i>Veterinary Record</i>
African Hunting Dog ecology, Zimbabwe	A Pole	NEZS	Financial support for field research PhD
Black and White Ruffed Lemur Re-introduction Project, Madagascar	Dr A Britt	NEZS	Financial support (supplies)
Bat behavioural project Rodrigues Island	V Jones (C West)	NEZS	Financial support
Conservation Genetics of Endangered Pheasants (WPADNA)	Dr R Wilkinson	NEZS	Financial support
Captive breeding and blood biochemistry analysis - Puerto Rican Crested Toad - Metro Zoo, Toronto, Canada	S Barabas	NEZS	Financial support
Rodrigues Island Fruit Bat, Seed Dispersal, Mauritius	I McDonald	NEZS	Financial support for research BSc
Conservation of Royal Parrot Finch, Vanuatu	G Douglas	NEZS	Financial support
Diadema '98 (New Caledonia) Skink and Gecko ecology	J Jones	NEZS	Financial support
Mother-infant interactions in Chimpanzees at Chester Zoo	C Bonney	NEZS	Financial support
'AFRICAT', Namibia (Cheetah and Leopard ecology)	C West	NEZS	Financial support (for radio-tracking equipment)
Flamingo Specialists Group Meeting Action Plan	Dr R Wilkinson	NEZS	Financial support



Above, *Twilight Zone*, central pool and fly-through 'rockwork cave'

Left, *Twilight Zone*, backlit interpretation panels devised by Education Division

We are grateful to 32 students who undertook on-site research.

First name	Surname	Qualification	Subject	University/College	Zoo area of study	Home
Gregory	Cavency	BSc	Applied Biology	Manchester Metropolitan	Chimpanzees	Oldham
Clare	Caws	BSc	Psychology and Zoology	Reading	Chimpanzees	Combe Martin
Jacqueline	Carter	BA Ed	Biology	Chester College	Primates	Solihull
Amanda	Collins	BSc	Animal behaviour with ecology and conservation	Anglia Polytechnic	Coatis	Grantham
Katherine	Curry	BSc	Psychology/Zoology	Reading	Chimpanzees	Duns
Beverley	Evans	BSc	Applied Zoology	Liverpool John Moores	Giraffes	Ross-on-Wye
Georgina	Frodsham	BSc	Applied Biology	Liverpool John Moores	Chimpanzees	Heswall
Kate	Galvin	BSc	Psychology	Liverpool Hope UC	Orang utans	Liverpool
		BSc	Environmental Studies	Liverpool Hope UC	Animal Conservation in British Zoos	
Phillip	Graham	BSc	Zoology	Liverpool	Primates	Liverpool
Andrew	Gregory	MSc	Computer Graphics Design	De Montfort, Leicester	Reptiles	Wigan
Lynn	Hallam	BSc	Biology/Psychology	Bolton Institute	Ruffed Lemurs	Swinton
Matthew	Hartley	BVetMed	Veterinary Science	Royal Veterinary College	Rhinoceros and Giraffes	Loughborough
Brian	Hayes	BSc	Biology/Psychology	Liverpool Hope UC	Chimpanzees	Liverpool
Sonya	Hill	MPhil/PhD	Biological Anthropology	Durham	Chimpanzees	Bromsgrove
David	Hughes	BSc	Applied Biology	Manchester Metropolitan	Primates	Runcorn
Damian	Jensen	BSc	Zoology	London	Lemurs	Manchester
Victoria	Kelly	BSc	Applied Biology	Liverpool John Moores	Primates	Liverpool
David	Kynaston	BA	Archaeology and Prehistory	Sheffield	Primates	Edinburgh
Deborah	Langner	MA	Heritage Studies	Salford	Bats	Sheffield
Jennifer	Litten	BSc	Applied Zoology	Liverpool John Moores	Primates	Mildenhall
Mark	Maddox	MSc	Global Biodiversity	Hull	Primates	Nuneaton
Victoria	Melfi	PhD	Zoology	Trinity College, Dublin	Primates	Aldershot
Konstantinos	Moraitis	MSc	Forensic Anthropology	Bradford	Mammals	Greece
Joanne	Nicholson	BSc	Zoology	Liverpool	Bali Starlings	Stannington
Alex	Parfitt	BSc	Biological Sciences	Reading	Penguins	Preston
Elizabeth	Pollard	PhD	Anatomy and Human Biology	Western Australia	Orang utans	Australia
Emma	Rodwell	BSc	Psychology	Liverpool	Apes	London
Chikako	Suda	MSc	Zoology	Liverpool	Chimpanzees	Japan
Karyn	Tremper	MSc	Conservation Biology	Kent	Bats	USA
Christine	Ung	BSc	Applied Biology	Manchester Metropolitan	Primates	Blackwood
Rebecca	Wild	BA	Graphic Design	Liverpool John Moores	Marketing	Bollington
Hazel	Worral	BSc	Psychology	Liverpool	Primates	Penzance

Manchester Metropolitan University MSc Courses in Conservation Biology and Behavioural Ecology

The Zoo is working closely with Manchester Metropolitan University in providing facilities and staff lecturers

The case studies include the following:

- The breeding history of the Blue-eyed Cockatoo at Chester Zoo
- Minimum viable population assessments: their relevance and importance for the future captive breeding of endangered species
- Disease and disease management: implications for captive breeding and reintroduction, introduction and translocation programmes
- Husbandry protocol for Golden Sea Ponies
- Orang utan breeding programme
- Introducing Chimpanzees into established groups in captivity
- The role of the hobbyists in captive breeding programmes: with special reference to the Lake Victoria Cichlids at Chester Zoo
- Environmental enrichment - a review
- Introduction to cryobiology and its importance to the future of captive breeding
- Detection of elephant reproductive status for use in captive breeding programmes
- The psychological care of Asiatic Elephants at Chester Zoo
- Veterinary care of Asiatic Elephants at Chester Zoo
- Environmental enrichment for Blue-eyed Cockatoos at Chester Zoo
- Breeding captive Asiatic Elephants with particular reference to artificial insemination
- Feeding and nutrition of captive Giraffe at Chester Zoo



We are grateful to 77 students who gave work experience time to the Zoo.

(JM= Junior Member)

First name	Surname	Course and School/College/University	Home
Helen	Allcroft	Zoo Animal Management Course, RAF	Sleaford
Carole	Bain	GCSEs, Pre Veterinary Science, West Kirby Grammar School	Wirral
Victoria	Ball (JM)	A Levels, Pre Veterinary Science, Queen's School, Chester	Chester
Lindsay	Blackburn	National Aquarium Australian Wildlife Sanctuary, Canberra	Australia
James	Blanshard	A Levels, Pre Veterinary Science, Neston County High School	Wirral
David	Brooks	A Levels, Pre Veterinary Science, Stretford Grammar School	Manchester
Suzie	Bryant	National Dip, Animal Care, Brinsbury College, West Sussex	Orpington
Kate	Burrow	A Levels, Pre Veterinary Science, Allerton Grange High School	Leeds
Marjolein	Busio	Animal Husbandry, Hogeschool, Delft	Netherlands
Sara	Connolly	HND Travel and Tourism, Wirral Metropolitan College	Greasby
Angela	Chesworth	Catering Experience, Chester Catholic High School	Chester
Henriette	Christiansen	Aalborg Zoo, Keeper Exchange	Denmark
Pamela	Dale	Veterinary Science, Liverpool University	Liverpool
Emily	Doughton	A Levels, Pre Veterinary Science, Sir John Deane's College	Northwich
Chris	Edwards	National Diploma in Fishery Studies and Aquatics, Brooksby College	Melton Mowbray
Alex	Emerick	National Aquarium Australian Wildlife Sanctuary, Canberra	Australia
Caroline	Evans	Leisure and Tourism, Christleton High School	Chester
Bethan	Freeman	A Levels, Pre Zoology degree, John Summers High School	Deeside
Nicola	Funnell	HND Travel and Tourism, Wirral Metropolitan College	Wirral
Ian	Grain (JM)	GCSEs, Bird Experience	Chester
Edwina	Grosvenor	GCSEs, Mostyn House School	Chester
Georg	Griese	GCSEs, Alsager School	Stoke-on-Trent
Moir	Goldie	Veterinary Science, Liverpool University	Liverpool
Camilla	Gustafsson	Animal Care, Västerby School	Sweden
Victoria	Harrild	A Levels, West Cheshire College	Chester
Paul	Hayes (JM)	GCSEs, Birkenhead School	Wirral
Vickie	Hickin	BSc, Marine Biology, Bangor University College	Shrewsbury
Kathryn	Humphries	BSc/BE, Biology, Chester College	Chester
Ellen	Jones	National Diploma in Animal Care, Pembrokeshire College	Milford Haven
Paul	Juniper	BSc, Zoology, Liverpool John Moores University	Southport
Laura	Kelly	National Diploma in Animal Care, Reaseheath College	Chester
Timothy	Lee	A Levels, Pre Veterinary Science, Wirral Grammar School	Chester
Kerry	Lindop	GCSEs, Forres Academy, Moray	Forres, Scotland
Huw	Lloyd	A Levels, Pre Veterinary Science, Oakham School	Oakham
Leanne	Lowton	National Diploma in Animal Care, Reaseheath College	Chester
Hazel	Marsden	GCSEs, Pre Zoology degree, Lancaster Girls' Grammar School	Carnforth
Angela	Masterson	BSc, Zoology, Liverpool University	Manchester
Hannah	McKerchar	Veterinary Science, Edinburgh University	Sheffield
James	McKowen	BSc, Marine Biology, Stirling University	Wirral
Nicola	Martinson	Veterinary Medicine, Robinson College, Cambridge University	Wirral
Richard	Meers	A Levels, Pre Veterinary Science	Altrincham
David	Moody	HND Recreation Leadership, Airedale and Wharfedale College	Leeds
Rebecca	Morley (JM)	GCSEs, Pre Zoology, Neston High School	Wirral
Elaine	Morris	National Diploma in Animal Care, Welsh Agricultural College	Kinnerton
Kim	Norman	HND Travel and Tourism, Wirral Metropolitan College	Little Neston
Natalie	Oaks	A Levels, Pre Veterinary Science, Rainford High School	St Helens
Emma	Owen	A Levels, Pre Veterinary Science, Holywell High School	Holywell
Anna	O'Sullivan	National Diploma in Animal Care, Reaseheath College	Crewe
Victoria	Parr	GCSEs, Pre Veterinary Science, Casterston School, Kirby Lonsdale	Kendal
Sarah	Pellet	BSc, Zoology, Liverpool University	Spalding
Stephen	Perry	BSc, Conservation Management	Wirral
Emma	Poore	BSc, Zoology, One year placement, Cardiff University College	Tamworth
Lucy	Powell	National Diploma in Animal Care, Welsh College of Horticulture	Mold
Gemma	Prophet	A Levels, Pre Veterinary Science, West Kirby Grammar School	High Peak
Sarah	Putwain	A Levels, Pre Veterinary Science	Wirral
Gudrun	Ravetz	Veterinary Science, Liverpool University	Liverpool
Lee	Roberts	GCSEs, Reptile Experience	Wrexham
Hazel	Savage	Post A Levels, Pre Veterinary Science	Wirral
Samantha	Sawyer	Post BSc Zoology, Durham University	Surrey
Laura	Sensicle (JM)	A Levels, Pre Veterinary Science, Queen's School, Chester	Kelsall
Biruntha	Senthinathan	Post A Levels, Pre Veterinary Science, Manchester High School	Manchester
Rehaan	Shah	BSc, Marine Biology, Bangor University College	Penyfford
Alice	Sharp-Pierson	BSc, Biological Sciences, Magdalen College, Oxford University	Malpas
Sharon	Smales	Diploma in Amenity Horticulture, Reaseheath College	Wirral
Marie	Soul	GCSEs, Pre Marine Biology, Brentwood County High School	Brentwood, Essex
Rachel	Sowerby	GCSEs, St Nicholas RC High School, Northwich	Northwich
Chris	Stevens	BSc, Animal Behaviour, De Montfort University, Leicester	Aldford
Daniel	Stevenson	A Levels, Pre Veterinary Science, Mosslands School, Wallasey	Wallasey
Kate	Tolliday	A Levels, Pre Veterinary Science, Oakham School, Rutland	Oakham
Marloes	Van der Ouderaa	Veterinary Science, Royal Veterinary College, London	Sharnbrook, Beds
Stuart	Walker	National Diploma in Animal Care, Lackham College	Swindon
Caroline	Williams	A Levels, Pre Veterinary, Sir John Deane's College, Northwich	Great Budworth
Helen	Williams	Post A Levels, Pre Veterinary Science	Wirral
Angela	Willis	A Levels, Pre Veterinary Science, Queen's School, Chester	Chester
Hannah	Woodward	A Levels, Pre Veterinary Science, Birkenhead High School	Chester
Gayle	Wootton	BSc, Zoology, Newcastle University	Heswall
Oliver	Yates	BSc, Biomedical Sciences, Sheffield Hallam University	Altrincham

More than fifty lectures were given in our lecture theatre during the year, together with numerous presentations to schools and colleges organised by Education and Marketing Divisions. The Director and Animal Division Staff gave several lectures to University Seminars and Zoological Conferences.

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|-----------|--|-----------|--|
| 10 Jan | <i>Pandas and the Mountains of Sichuan</i>
Tony Ord (MM) | 22 May | <i>Animal Discovery and the Camera</i>
Sir David Attenborough (SM - in conjunction with Gold Medal ceremony) |
| 22 Jan | <i>Natural Vision</i>
Dr Heather Angel (SM) | 30 May | AGM of the North of England Zoological Society (MM) |
| 30-31 Jan | European Fish and Aquatic Invertebrate TAG / European Association of Aquarium Curators workshop (SM) | 9-11 Sept | UK Plant TAG meeting Director and Gardens Staff (SM) |
| 14 Feb | <i>Birds of Northern India</i>
Dr Roger Wilkinson (MM) | 12 Sept | <i>Last Chance to See</i>
Douglas Adams (MM/SM - in conjunction with official opening of <i>Twilight Zone</i> Bat Cave) |
| 14 March | <i>Can we afford to love our animals to death?</i>
Nicholas Ellerton (MM) | 10 Oct | <i>What people get wrong about animals</i>
Professor Jack Cohen (MM) |
| 20 March | <i>Glimpse of a Vanished World</i>
John Edwards (FFI) | 16 Oct | <i>Cheetah Conservation in Namibia</i>
Laurie Marker-Kraus (FFI) |
| 17 April | <i>On the trail of Whales and Dolphins</i>
Mark Carwardine (FFI) | 14 Nov | <i>Guyana: one return to adventure</i>
Graham Pollard (MM) |
| 24 April | <i>South Atlantic Albatrosses and Penguins</i>
John Croxhall (FFI) | 20 Nov | <i>The Lost Camels of Tartary</i>
John Hare (FFI) |
| 25 April | <i>Zoo Review</i>
Director and staff (MM) | 24 Nov | <i>Exotic Species and the Law</i>
Conference. Prof David Bellamy and Cheshire Constabulary Wildlife Officer, PC Mike Wellman (SM) |
| 8-10 May | Annual Conference of the Federation of Zoological Gardens of Great Britain and Ireland (SM) | 12 Dec | <i>Rainforest, Fires and Orang utans</i>
Lisa Mather (MM) |
| 20-21 May | BVZS/EAZWV Veterinary Conference in Chester, Zoo tour | | |



The Zoo Director attended the 53rd Annual Meeting of the World Zoo Organisation (IUDZ) at Nagoya, Japan.

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* This book is a result of an international conference organised at Chester Zoo in 1995. Many distinguished workers in the field have contributed to this volume which is an extensive review concerning research on prosimian primates over two decades. Several participants are from the habitat countries. Essential data and new ideas on biology, conservation and management are covered. The publication is an invaluable reference for zoologists, comparative anatomists, paleontologists and curators and keepers of mammals.

**CBSG Population and Habitat Viability Analysis part-funded by Chester Zoo.

***These publications relate to important research on walking and climbing in apes and humans using a force plate installed in our Chimpanzee Island.

Chester Zoo – The North of England Zoological Society - is a Charitable Trust, independent of the Government and Local Authorities. Its main source of income is from paying visitors and it welcomes sponsorship



CHESTER

North of England Zoological Society

The Society would like to thank everyone who has helped in 1998 — Council, Members, Benefactors, individual and corporate Adopters, permanent and seasonal Staff, Work Experience Students, Visiting Researchers, Chester City Council, Cheshire County Council, Volunteers and our many Visitors and Friends.

We are also grateful to Suppliers and Contractors for often achieving that 'extra' for us that makes all the difference.

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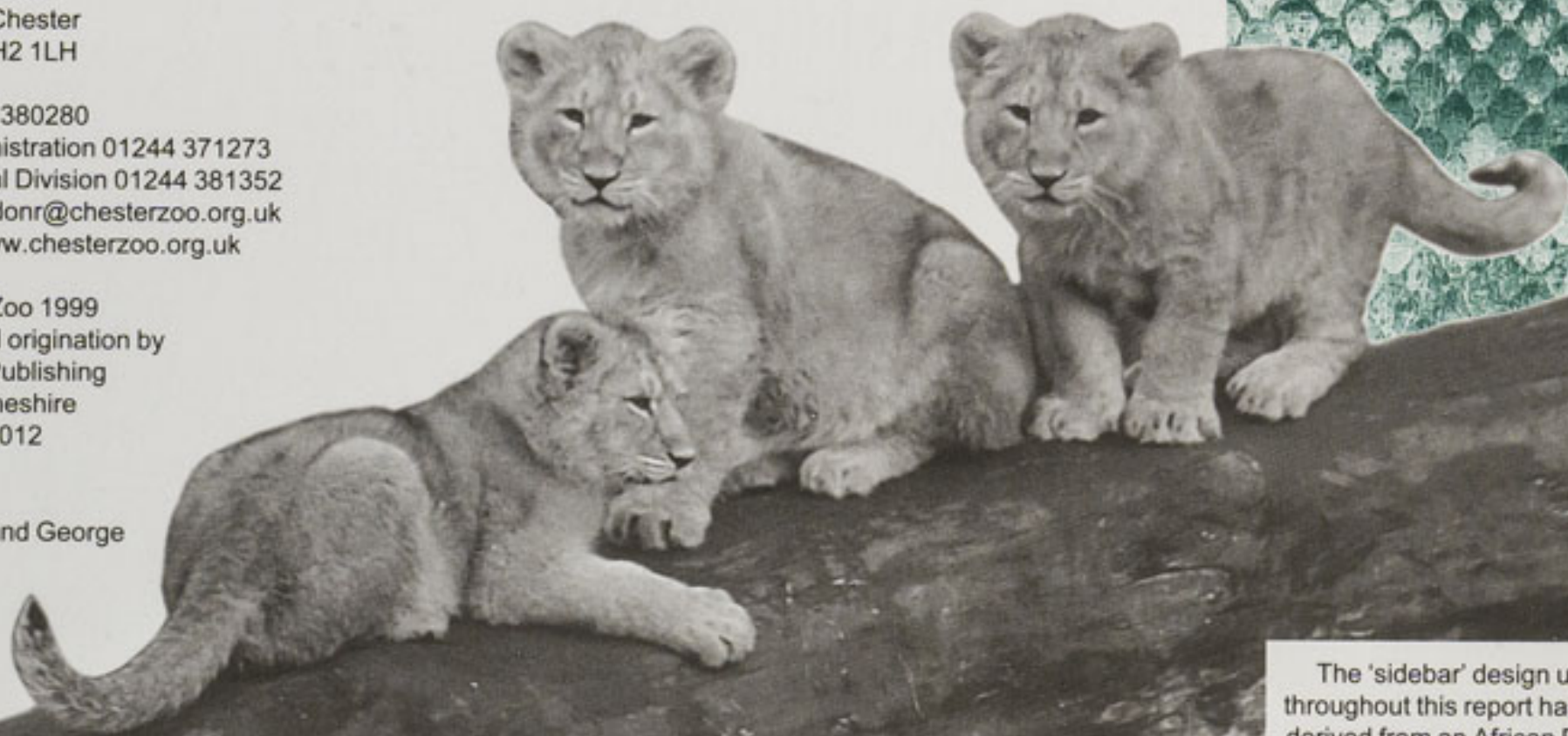
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Caughall Road
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Chester CH2 1LH

Tel: 01244 380280
Fax: Administration 01244 371273
Fax: Animal Division 01244 381352
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The 'sidebar' design used throughout this report has been derived from an African Python skin used by Education Division as a teaching aid

The North of England Zoological Society
Nominees for Council 1999

Jean Dixon - Member No 1095

A Life member of the Zoo, a former scientist at Shell Research. Member of many wildlife societies with interests in ecology and our natural heritage.

Kath Edwards - Member No 1610

A graduate in zoology. Corporate Communications Manager of a financial institution. A supporter of Junior Member events and Chairman of the Programme Committee.

Brian Gardiner - Member No 11317

Professor of Zoology at Kings College, University of London and the Past President of the Linnean Society of London. A speaker at Chester Zoo's Members meetings.

Chris Mahon - Member No 11967

Director and head of conservation at The Cheshire Wildlife Trust. His degrees are in environmental studies.

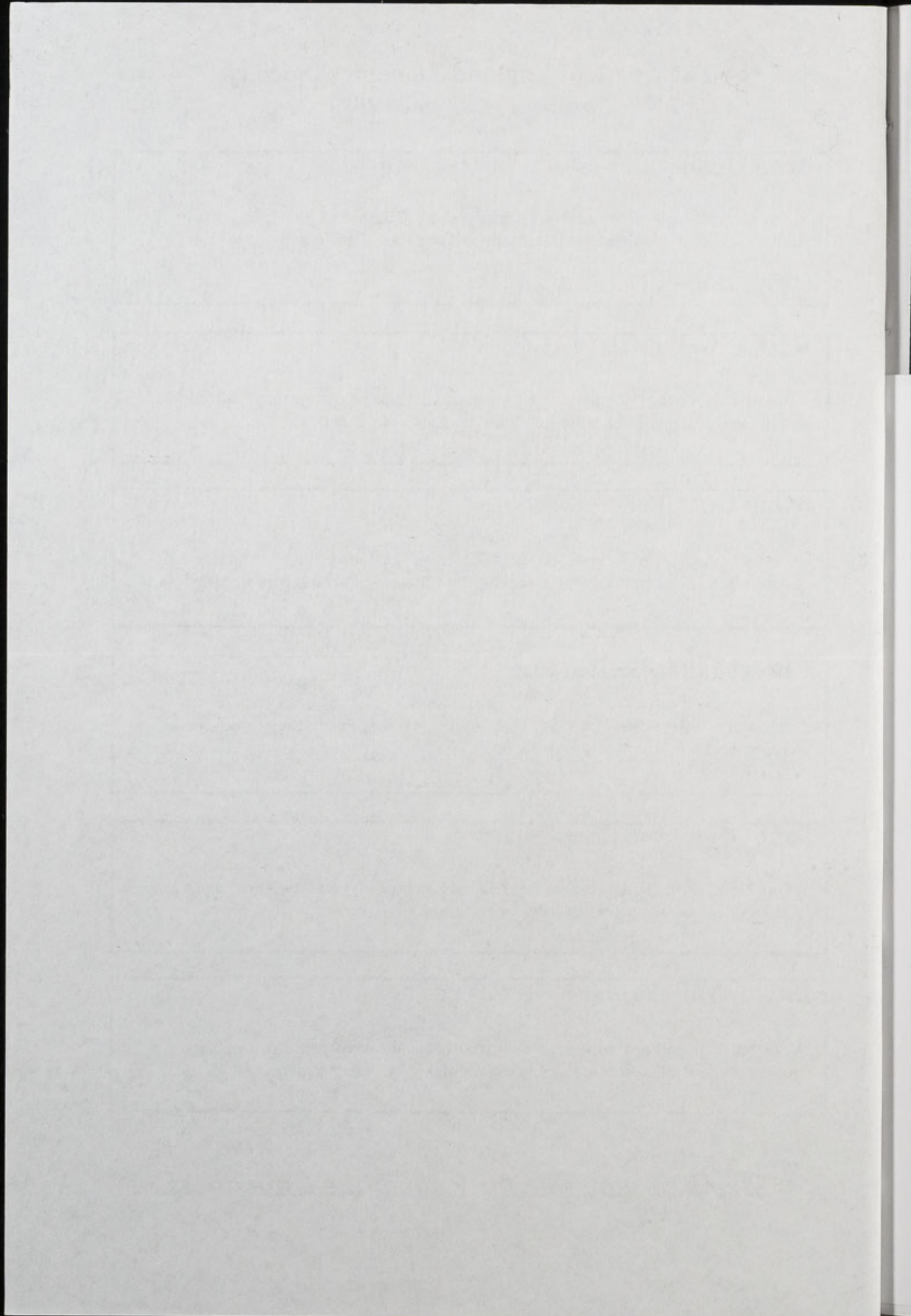
John Makinson - Member No 1137

A Life Member of Chester Zoo. A local retired Solicitor, 40 years in Chester and a long term supporter of zoo activities.

David Wall - Member No 6620

A computer support analyst with an international chemical company. A member for seven years with a keen interest in big mammals, including elephants.

Members may vote for 5 out of the 6 nominees



THE NORTH OF ENGLAND ZOOLOGICAL SOCIETY

ANNUAL GENERAL MEETING - 22 May 1999

Agenda Item 5. Voting on subscription increases (if the Special Resolution at the EGM is not passed)

FOR	AGAINST

Special Resolution

FOR	AGAINST
-----	---------

re-election of Council members

Article 32
Article 32

Council to decide by a majority available to members

Article 8(c)

and make them more flexible

Article 8(b)
Council to determine the annual subscription of members to streamline procedures

Special Resolution changes to the Company's Articles of Association:

EXTRAORDINARY GENERAL MEETING - 23 MAY 1999
THE NORTH OF ENGLAND SOCILOGICAL SOCIETY

THE NORTH OF ENGLAND ZOOLOGICAL SOCIETY

NOTICE IS HEREBY GIVEN that an Extraordinary General Meeting of the above-named Society will be held in the Lecture Hall, Chester Zoo on Saturday, 22nd May 1999 at 2:30 p.m. for the purpose of considering and, if thought fit, passing the following Resolution as a **SPECIAL RESOLUTION**:-

1. **THAT** the existing Articles 8(b), 8(e) and 25 as set out in the Articles of Association of the North of England Zoological Society be abrogated and thereupon replaced by the adoption in their place of new Articles 8(b), 8(e) and 25 in the following terms:

"8. The terms and privileges of membership shall be as follows:

(b) ANNUAL MEMBERS shall pay an Annual Subscription of such sum as shall be determined by the Council from time to time. Annual Members of the Society who have completed twenty-five years membership, and have reached the age of sixty years shall not be required to pay any further annual subscription."

"(e) Life Members and Annual Members who are not in arrear with their subscriptions shall have personal admission without payment to the Society's Gardens and Collections. The Council may make regulations for additional privileges for members of all categories of the Society, consistent with the aims of the Society and may from time to time amend such regulations and alter cancel or curtail such privileges."

"25. (a) For the purposes of this Article 25 the expression "year" shall mean the period between one Annual General Meeting of the

Society and the next.

- (b) At each Annual General Meeting of the Society one-third of the elected members of the Council (excluding the Chairman and the Vice Chairman) shall retire from office. If the number of such elected members is not a multiple of three, then the number nearest to one-third shall retire from office.
- (c) The elected members who shall retire at the end of each year shall be those who have been longest in office. If two or more persons became members of the Council on the same day, then unless otherwise agreed between themselves, those to retire shall be determined by lot.
- (d) Any retiring member who has been in office for a continuous period of six years shall not be eligible for re-election until he has been out of office for a period of one year."

A member entitled to attend and vote at this Meeting is entitled to appoint a proxy to attend and vote in his stead. A proxy must be a member of the Society whose subscription is not in arrears.

By Order of the Board

M. A. R. Johnson
Secretary

Date: 22nd April 1999

Registered Office:
Upton,
Chester,
CH2 1LH

THE NORTH OF ENGLAND ZOOLOGICAL SOCIETY - AUTHORISATION FOR PROXY VOTE

I Member number

of the Society, whose subscription is not in arrears hereby appoint **the Chairman of the Meeting**
or, failing him

..... Member number

or, failing him

..... Member number

as my proxy to vote on my behalf at the General Meetings of the Society to be held on Saturday,
22 May and at any adjournment thereof.

Signed this day of 1999 Signature

**This form is to be used to vote in favour of or against the Resolutions as set out below.
Unless otherwise instructed the proxy will vote as he thinks fit.**

EXTRAORDINARY GENERAL MEETING

Special Resolution

FOR	AGAINST

ANNUAL GENERAL MEETING

Agenda Item 5. Voting on subscription increases (if the Special
Resolution at the EGM is not passed)

FOR	AGAINST

Agenda Item 8. Election of Members of Council - *you may only vote for 5 candidates*

- Dixon, Miss J
- Edwards, Miss K
- Gardiner, Professor B
- Mahon, Mr C
- Makinson, Mr J
- Wall, Mr D

Though Council is charged with nominating candidates to fill vacancies and has included the names of its nominees with the Notice of Meeting, the final list of candidates will not close until noon Saturday, 8 May 1999. Members wishing to vote by proxy may wish to defer giving their instruction until after this date. A list of candidates will be displayed on the Society's Notice Board in Oakfield House, Chester Zoo, and will be sent to those who intend to vote by proxy and who have asked by 13 May 1999 for the final list to be posted to them.

**This proxy form is to reach the Company Secretary at Oakfield House,
Zoological Gardens, Chester, CH2 1LH by noon Thursday, 20 May 1999**

NOTE: New members who submitted their applications to join the Society on or after Sunday 25 April 1999 are not entitled to vote at the Annual General Meeting on 22 May 1999, 28 days not having elapsed in the meantime.

THE NORTH OF ENGLAND ZOOLOGICAL SOCIETY - AUTHORIZATION FOR PROXY VOTE

I, the undersigned, being a member of the Society, do hereby authorize the Chairman of the Meeting of the Society, whose subscription is not in arrears, to act in my stead in voting at the Meeting of the Society on any business which may come before the Meeting of the Society on the day of the Meeting, and at any adjournment thereof.

Member number: _____

Signature: _____

Date: _____

EXTRAORDINARY GENERAL MEETING

FOR	AGAINST

Special Resolution

Resolved that the Chairman of the Meeting be authorized to act in my stead in voting at the Meeting of the Society on any business which may come before the Meeting of the Society on the day of the Meeting, and at any adjournment thereof.

ANNUAL GENERAL MEETING

FOR	AGAINST

Resolved that the Chairman of the Meeting be authorized to act in my stead in voting at the Meeting of the Society on any business which may come before the Meeting of the Society on the day of the Meeting, and at any adjournment thereof.

The proxy form is to reach the Company Secretary at Oakfield House, Zoological Gardens, Chester, CH3 1JH by noon Thursday, 25 May 1999.

NOTE: New members who submitted their applications to join the Society on or after Sunday 15 April 1999 are not entitled to vote at the Annual General Meeting on 23 May 1999, 28 days not having elapsed in the meantime.

By Order of the Society

Secretary

Mr. A. M. Wall, Mr. D. ...

Mr. J. ...

Mr. C. ...

Mr. J. ...

Mr. J. ...

Mr. J. ...

Mr. J. ...

PREAMBLE

**TO THE ZOO MEETINGS
ON SATURDAY 22 MAY 1999**

IN THE LECTURE HALL, CHESTER ZOO

Normally there is one general meeting of the North of England Zoological Society held each year, called the Annual General Meeting (AGM).

On this occasion in 1999, your Council wishes to make small changes to the Company's Articles & Memorandum of Association - its regulatory rules. An Extraordinary General Meeting (EGM) will take place immediately before the AGM, at which the changes will be considered. The changes will be voted on at the EGM and will take effect if not less than 75% of the members voting (whether in person or by proxy) do vote in favour of the changes.

In brief, the changes are as follows:

Article 8(b)

Council to determine the annual subscription of members to streamline procedures and make them more flexible. It is also hoped to announce at the AGM together with annual increases in subscriptions, a substantial discount for payment by direct debit. The implementation date of the changes is likely to be this summer.

Article 8(e)

Council to decide privileges to members. A list of current privileges is attached. (Members should note that the annual number of half priced tickets issued to them with their annual membership card has been increased to 10).

Article 25

A restatement of the Article to clarify the process of rotation and re-election of Council members.

THESE ARE IMPORTANT CHANGES. IF YOU DO NOT INTEND TO ATTEND THE EGM AND AGM, WE HOPE YOU WILL NEVERTHELESS COMPLETE AND RETURN THE PROXY FORM ATTACHED.

PREAMBLE
TO THE ZOO MEETINGS
ON SATURDAY 21 MAY 1999

MEMBERS CONCESSIONS FROM THE CHARITY

- Free admission to zoo during normal visitor opening hours.
- Voting rights at AGM.
- 10 half price vouchers.
- Functions and lectures.
- 10% discount in shops on purchases of £2 or more on production of valid membership card.
- Quarterly magazine/literature.
- Use of Library.
- Organised trips/safaris.

(This sheet to be issued at the EGM/AGM)

CHANGES IN MEMBER SUBSCRIPTIONS

Approved by your Council, subject to the results of today's meetings.

New members and those <u>not</u> paying by Direct Debit will pay:		
ANNUAL	under 65 years	£40 pa
	65 years and over	£30 pa
JOINT	both under 65 years	£66 pa
	one over 65 years	£59 pa
	both over 65 years	£50 pa
JUNIOR	3 - 17 years	£13.50 pa

Adult Members agreeing to renew by Direct Debit after their first year will pay the increased subscription rate, less a £5 discount.

<u>Members agreeing to pay by Direct Debit after their first year</u> will not be required to pay an increase on their current subscription rate:		
ANNUAL	under 65 years	£35 pa
	65 years and over	£25 pa
JOINT	both under 65 years	£61 pa
	one over 65 years	£54 pa
	both over 65 years	£45 pa
JUNIOR	3 - 17 years	£13.50 pa

CHANGES IN MEMBER SUBSCRIPTIONS

Approved by the Council at the AGM/EGM on 15/11/2011

New members and those not paying by Direct Debit will pay:

Annual	65 years and over	£30 pa
	both under 65 years	£30 pa
Joint	one over 65 years	£33 pa
	both over 65 years	£30 pa
Junior	3 - 17 years	£13.50 pa

Free of charge to all members aged 18 years and over.

• Young Family Discount: £10 off for both under 65 years.

• 10% discount on purchases of £20 or more in shops in schools in 2012.

• Adult members agreeing to pay by Direct Debit after their first year will pay the increased subscription rate less a 5% discount.

• Quantity discounts available.

Members agreeing to pay by Direct Debit after their first year will not be required to pay the increase on their current subscription rate.

• Organized social events.

Annual	65 years and over	£33 pa
	both under 65 years	£30 pa
Joint	one over 65 years	£34 pa
	both over 65 years	£30 pa
Junior	3 - 17 years	£13.50 pa

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*MINUTES OF AN EXTRAORDINARY GENERAL MEETING
OF THE NORTH OF ENGLAND ZOOLOGICAL SOCIETY
HELD ON SATURDAY, 22 MAY 1999 AT 2.30 PM IN THE
LECTURE HALL*

51 members were present

Mr Keith Maybury in the Chair

1. INTRODUCTION.

The Chairman welcomed everyone and explained that the purpose of the meeting was to put before the membership the proposed changes to the Company's Articles of Association, details of which had been circulated to members prior to the meeting. He then invited comments from the floor.

Some lively exchanges followed, led by Mr Nick Wilson, who felt that some of the changes were contentious. The points he raised were countered by Mr John Makinson who had, in fact, re-drafted the changes under discussion. Other members debated the pros and cons of half price vouchers versus pre-paid zoo entry tickets. Everyone wishing to make a point was allowed to do so, after which the appointment of the scrutineers was approved and the ballot took place. The result was:

For	287 (91%)
Against	28 (9%)

The Chairman announced that the changes to the Articles will now take place and the meeting concluded.

THE NORTH OF ENGLAND ZOOLOGICAL SOCIETY
14 Chester Zoo, Chester, CH2 1JH
Tel: 01244 221111
Fax: 01244 221112

NOTICE OF AN EXTRAORDINARY GENERAL MEETING
to be held at 2.30 pm on Saturday, 22 May 1998 at the
Russell Allen Lecture Hall, Chester Zoo

AGENDA

1. Introduction to the EGM by the Chairman.

2. To consider the Special Resolution proposed to the
Company's Articles of Association.

- Article 6(b)
- Article 6(c)
- Article 13

3. To appoint auditors and ratify the Special Resolution.

NOTE: 21 days notice of this meeting has been given together with the
changes intended.

Bring a 75p voting coupon if required, a full will be held and a proxy vote
form is attached for members not attending the meeting.

M A R Johnson
Company Secretary

23 April 1998

THE NORTH OF ENGLAND ZOOLOGICAL SOCIETY
14 Chester Zoo, Chester, CH2 1JH
Tel: 01244 221111
Fax: 01244 221112

THE NORTH OF ENGLAND ZOOLOGICAL SOCIETY
Chester Zoo, Chester, CH2 1LH

NOTICE OF AN EXTRAORDINARY GENERAL MEETING
to be held at 2.30 pm on Saturday, 22 May 1999 at the
Russell Allen Lecture Hall, Chester Zoo

A G E N D A

1. Introduction to the EGM by the Chairman.
2. To consider the Special Resolution changes to the Company's Articles of Association:

Article 8(b)
Article 8(e)
Article 25
3. To appoint scrutineers and ballot on the Special Resolution.

NOTE: 21 days formal notice of this meeting has been given, together with the changes intended.

Since a 75% voting majority is required, a poll will be held and a proxy vote form is attached for members not attending the meeting.

M A R Johnson
Company Secretary

23 April 1999

Members are reminded that they may vote by proxy, using the form enclosed, provided the form of proxy reaches the Company Secretary at Oakfield House, Zoological Gardens, Chester, CH2 1LH by noon, Thursday, 20 May 1999.

The Articles of Association are available for inspection at the Society's Registered Office at Oakfield House during normal working hours (Monday-Friday 9.00 am-5.00 pm **except Monday, 3 May 1999**).

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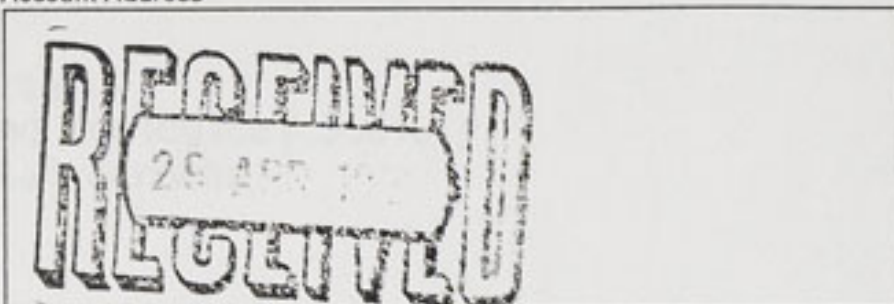
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NOTICE OF AN EXTRAORDINARY GENERAL MEETING

to be held at Lecture Hall, Chester Zoo on Saturday, 22 May 1993

PLEASE PAY BY 19/05/93
TERMS 151 DAYS

AGENDA

1. Introduction to the EGM by the Chairman.

To consider the Special Resolution changes to the Company's Articles of Association:

- Article 10
- Article 11
- Article 12

3. To consider and determine what to do on the Special Resolution.

2000.00

0.00

2000.00

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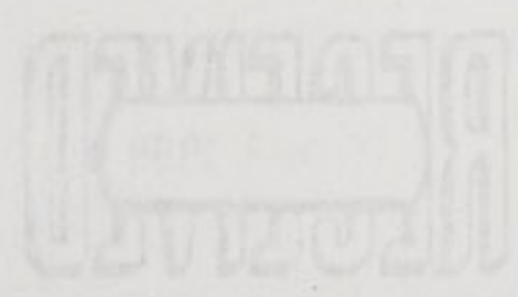
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