



IE MARWELL PRESERVATION TRUST LIMITED

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Letter from the Chairman and Director

Our 25th Anniversary Year turned out to be a real landmark year!

A record number of visitors was most satisfying and appropriate for our 25th Anniversary and helped us achieve much of what follows below.

Most of the events and occurrences are detailed elsewhere in this report, but a few of the 'major highlights' should be mentioned here.

The opening of Penguin World by HRH The Princess Royal was the first of the commemorative activities and it was a most fitting beginning. Her Royal Highness has always shown a keen and knowledgeable interest in our activities and this was certainly the case on 8th May, when her presence rewarded all who had worked to achieve our outstanding Penguin exhibit – most of all, the Marwell Zoological Society and its diligent band of fund-raisers.

Our Anniversary Year was further marked by a David Shepherd Evening, sponsored by our bankers, National Westminster, with David being both entertaining and instructive in his inimitable and charismatic fashion. This played to a full audience and benefited both the David Shepherd and Marwell Trusts.

Subsequently, at a Celebration Evening, an original David Shepherd painting of an Elephant in the Luangwa Valley raised £8,000 for our future education unit.

The 25th Anniversary Year was also marked by a Seminar held jointly with our friends at Southampton University, in the University, entitled 'Conservation and Compromise'. The event, supported by Associated British Ports, sought to address, as we believe conservationists must, the realities of growing human numbers and their aspirations. If many species and habitats are to survive, there must be goodwill and mutual understanding arising from education.



The visit by HRH The Princess Royal for the opening of Penguin World launched Marwell's 25th Anniversary celebrations. The Princess and Director, John Knowles, chat with Head Keeper, Geoff Read.

Photo: Gus Malcom



HRH The Princess Royal leaves the new Ark Gift Shop at the end of her visit in the company of (left to right) Director, John Knowles, Chairman of the Board of Trustees, Nicholas Jonas, and Trustee, Mrs. M.D. Knowles

Photo: Gus Malcom

Finally, we took the opportunity to thank all our loyal and hard-working staff at an informal staff dinner enjoyed by everyone.

Our animal groups generally grew and prospered, whilst not without inevitable disappointments which come when dealing with an animal community the size of a large village.

Our support for conservation activities overseas, including the landmark decision to establish the Marwell Zimbabwe Trust, grew in both financial and personal terms. We took many steps towards becoming a force in conservation outside as well as inside Marwell, both with exotic and native species. The philosophy of conservation is not divisible!

Education, being one of the foundation blocks of Marwell's mission, is well served by an excellent and dedicated team – working, however, in most unsuitable conditions. One of the highlights of 1997 was the promise of a grant, which will enable us to build a first-class facility in which to teach a wide variety of ages and abilities about both the wonders and the fragility of our planet. By the end of 1997, planning for this building was in an advanced stage – and, hopefully, our 1998 report will feature the building, either at, or near, completion.

Other plans were laid for the future. Inevitably, one year's work is much directed at the next. This included, in 1997, the appointment of a new Director for Marwell Zoological Park, whose term of office begins in April 1998.

A wonderful year like that of our quarter century and all the years that have gone before have only been possible because of a first-class staff and that unique band of supporters, the Marwell Zoological Society, which understands and supports the Marwell Mission. The Trustees wish to express their thanks to all these groups.

NICHOLAS JONAS · JOHN KNOWLES

Postscript by the Chairman

As this letter goes to print, I feel strongly that I cannot let this opportunity pass without paying heartfelt tribute to our outgoing Founder Director, John Knowles.

John steps down as Director on 31st March 1998, but to all our joy and satisfaction will remain as Honorary Marwell Preservation Trust Director and, of course, a Trustee.

All of us – fellow Trustees, our staff and the community at large – owe John a tremendous debt of gratitude for what he has created here and so successfully managed over the last twenty-five years.

The award by HM The Queen of his OBE in 1991 recognised his outstanding contribution to global wildlife conservation, both in the UK and overseas.

John, a big 'thank you' and ongoing success in your next career – still, hopefully, based at Marwell.

I will also take this opportunity to extend a very warm 'welcome' to Dr. Miranda Stevenson, who joins us as Director on 1st April 1998, straight from her role as Curator and Deputy Director of the highly successful Edinburgh Zoo. We look forward to working with her and giving her our support.

NICHOLAS JONAS

1997 – The Landmark Year

Physically, the major new presence was the new Marwell 'Ark Gift Shop' and its surrounding landscaping. This very substantial investment precluded other large scale developments, but will, hopefully, support all our activities in the future as an impressive and efficient retail outlet.

Other works included a new Red Panda enclosure in Wallaby Wood, as well as refurbishment of the older Red Panda facility. One aspect of twenty-five years is the need for an ever-increasing maintenance budget and effort!

Inevitably, one year's accomplishments are largely planned for and often organised in the year previous to the one in which construction actually takes place. Such is the case with the 1998 projects, which are a new Giraffe House, scheduled to commence in February, and an Education Centre.



Visitor numbers reached an all-time record, thanks to a combination of good weather at peak visitor times (with the exception of June), better marketing and a growing appreciation of the satisfying 'day out' that Marwell represents, with its unique ability to provide pleasure combined with learning in an attractive setting designed for the comfort and welfare of both visitors and animals.

Actual visitor numbers (with 1996 figures in brackets) were:

General	348,738	(313,472)
Marwell Zoological Society	31,046	(22,367)
Complimentary	5,819	(5,800)
	385,603	(341,639)

This is an increase of just over 12.8%.



The animal collection, as usual, provided both joy and sadness, surprises and disappointments. The major event, without doubt, was the birth of our long-awaited first Okapi baby. This was to prove a heart-stopping experience before it eventually became a joy.

Every precaution had been taken to ensure a safe, happy event, including a remote-control video camera, with a viewing facility in the North Section Keepers' Rest Room. Birth began in the morning of 25th March, watched by as anxious a group of Marwell staff as has ever gathered in one small space. The birth was easy, taking no more than forty minutes – but, to our horror, Bibi, the new mother, attacked her calf, with an unmistakable intent to kill, and the life of Elila (as the new baby was later called) was saved, firstly by the good fortune of an inaccurate kick from Bibi and secondly by the courage of Head Keeper, Simon Hawker, who saved the new-born precious female from certain death.

The unique and often difficult struggle to hand-rear the baby will be published elsewhere. Suffice to say that Elila represents a tribute to the skills and hard work of the staff of North Section, our Curators, and the encouragement and advice received from the Okapi breeding centres of Brookfield Zoo, Chicago, and Antwerp.

Allowing for age-related deaths, the steady growth of our hoofstock herds, whilst less dramatic, remains a source of pleasure and encouragement, but at the same time causing more than a little pressure on housing space.

This limitation has caused us temporarily to cease keeping Brazilian Tapir, in order to concentrate on the more threatened Malayan species, of which three have joined us during the year. The female is a Marwell-bred animal returned from the Howletts and Port Lympne Foundation. The two males came from Mulhouse and Singapore Zoos respectively, both on breeding loan. Another female from North America is expected in 1998.

Unfortunately, the shortage of quality 'zoo spaces' worldwide means that we limit reproduction with a number of the carnivores in accordance with international breeding programmes. Nevertheless, the birth and rearing of a litter of Bush Dogs, Marwell's first for this species, was most welcome.

Amongst the birds, hatchings were few, although a number of significant pairings were achieved of often immature birds, and we look to the future with optimism. This is especially the case with our Penguins, who are already showing signs of understanding reproduction goals.



The full Board of Trustees met twice during the year and there were regular meetings of the various supporting Committees, including one chaired by Mary Sabben-Clare to supervise the 25th Anniversary programme.

Arthur Hill retired from the Board in line with the Trust's age policy. We are grateful for his long period of enthusiastic and wise contributions to the Trust, which will be sadly missed.

At the same time, we welcomed three new Trustees to the Board in the persons of Mrs. Alison Chestnutt, Prof. Norman Maclean and Mrs. Christine Quayle.



In August, the Director passed the Chairmanship of ISIS (International Species Information System) to the Director of Pretoria Zoo, Willie Labuschagne, after a number of years service, during which time ISIS has gone through a period of substantial growth. This was at the Annual General Meeting of ISIS, which took place in Berlin – the venue for the annual meetings of the Conservation Specialist Group (CBSG) and the International Union of Zoo Directors – the World Zoo Organisation.

Marwell continues to support CBSG financially and by the Director serving on its Steering Committee.

Immediately after the Berlin meetings, the Director attended the annual meeting of the International Rhino Foundation (IRF), of which he is the only European Trustee, at the Rhino breeding facility at the El Coyote Ranch in Southern Texas. The work of IRF relates closely to that of the Marwell Zimbabwe Trust, which the Director initiated during visits to that country.

The Director continued to serve on the Editorial Board of the International Zoo Yearbook.

In April 1997, John Knowles advised the Trustees of his wish to retire as Director of Marwell Zoological Park. Consequently, advertisements were placed and a selection process began, from which Dr. Miranda Stevenson, currently Curator and Deputy Director of Edinburgh Zoo, was chosen. She takes office on 1st April 1998.

John Knowles will become Honorary Director of the Marwell Preservation Trust and will be particularly involved in Marwell's growing conservation interests.



During 1997, the General Curator, Peter Bircher, continued his involvement with the UK Genome Banking Group – though this group remains somewhat inactive because of the urgent need to secure adequate funding.

He also continued his involvement with the Department of Zoology at London Zoo in setting up a research facility at Whipsnade Wild Animal Park to study the reproductive biology of the Red Panda. This facility will also develop non-invasive techniques for monitoring the reproductive status of female Red Panda, both in captivity and the wild state.

In September, he arranged and supervised the visit of two Indian zoo officials from Darjeeling and Sikkim Province for three weeks management training as part of Marwell's long-term technical support commitment to the Indian Central Zoo Authority. This important programme also supports the captive breeding and long-term conservation of Red Panda in the Himalayas.



Peter Bircher continued his involvement with the Pigs and Peccary Taxon Advisory Group in the role of co-chair.

Deputy Curator, Peter Small, also continued as a member of the Taxon Advisory Group for Rodents and Lagomorphs, Primates and Small Carnivores; with Assistant Curator, Gordon Campbell, representing Marwell on the Crane Taxon Advisory Group.

Niki Leedell and Simon Wakefield continued to maintain the international studbooks for Hartmann's Mountain and Grevy's Zebra respectively.



Baby Giraffe 'Matilda' soaks up some winter sun
Photo: David Baxter

BIOLOGIST'S REPORT 1997



EEP
(European Endangered
Species Programme)



i) EEP Equid Taxon Advisory Group (TAG)

The sixth meeting of the TAG was held at the EEP conference in Alphen a/d Rijn in October. This meeting reported to the conference on the progress of the TAG during 1996/97 and it was agreed to hold a working meeting of the TAG in Spring 1998. Reports were presented on continued efforts to resolve the taxonomic status of Onager and Kulan, the updated survey of equid space in European collections, and the first use of criteria designed to identify the priority taxa which the TAG should recommend for *ex-situ* breeding programmes.

A large number of Kulan and Onager samples have been analysed, all from zoo animals, using DNA microsatellite analysis. However, as yet there are no exclusive qualitative markers to distinguish them, which suggests that Kulan and Onager are probably not full sub-species. We also know from the release programme in Israel that Kulan/Onager hybrids have shown no problems in adapting to free-living conditions. A final presentation of the results and a discussion of their implications for the management of the captive populations of these asses will be an important part of the next Equid TAG meeting.

The space survey conducted in 1994 was repeated in 1997, with a much higher response (more than 150 zoos). An initial summary shows that 37% of equids reported are Plains Zebra, 35% are Przewalski's Horses and the remainder are made up from Kulan, Onager, Grevy's Zebra, Hartmann's Mountain Zebra and Somali Wild Ass. It was also noted that certain combinations of equid species have been shown to work well, e.g. Cologne Zoo maintain a mixed bachelor group of Przewalski's Horses and Onager. A summary of the management problems and successes of mixed exhibits involving equid species is also being prepared.

One of the most important roles of the TAG will be to recommend which taxa are most in need of captive breeding. Various selection criteria have been developed by different TAGs as a method for assessing TAG priorities, based on a range of considerations, e.g. conservation status/regional breeding programme, educational and institutional criteria. Using one assessment system, a trial evaluation for Europe was done by the TAG co-chairs, with the following outcome:

Przewalski's Horse (*highest priority*)
Somali Wild Ass

Grevy's Zebra
Hartmann's Mountain Zebra
Onager
Kulan
Eastern Kiang
Plains Zebra (individual sub-species were not addressed)
(*lowest priority*)

Przewalski's Horse was particularly favoured under this system, because of the links with reintroduction projects. The development of a valid set of selection criteria for use by the Equid TAG will be one of the next important steps to be taken by the TAG.

Finally, two other goals have been identified for 1997/98. Firstly, a Husbandry Guidelines sub-group has been formed to develop guidelines to cover all the exotic equids held by zoos. So far, EEP husbandry guidelines are available only for Przewalski's Horse; work has also begun on guidelines for Grevy's Zebra (*see below*). Secondly, an overview of the current status of the Plains Zebra population is needed, in order to address the future needs of this group in relation to the other equid populations.

ii) Scimitar-horned Oryx European Endangered Species Programme (EEP)

An important contribution to the keeping of Oryx in zoos was the completion by Juergen Engel of his PhD thesis, entitled 'Die Bedeutung von Junggesellengruppen für die Haltung von Säbelantilopen (*Oryx dammah*) in Zoologischen Gärten' (The Importance of Bachelor Groups for Keeping Scimitar-horned Oryx in Zoological Gardens). He had examined the dynamics of bachelor groups held in captivity and some of the problems experienced. Out of this research have come some useful recommendations for being able to maintain bachelor groups with the minimum of aggression.

One of the continuing problems with this programme is that, for many individuals, all or part of their ancestry is unknown. In some cases, this is because animals are being born and are not being assigned parentage, and it is recommended that every new-born individual should be marked and parents identified correctly. A proposal was also discussed at the Committee meeting in Alphen, whereby the population should be separated into two groups – animals with (almost completely known) genetic background and those with little or no known history – and that these two groups should be managed separately.

iii) Grevy's Zebra EEP

This EEP is also fortunate in having a PhD thesis based on observations of captive animals recently completed. Ulrike Rademacher's thesis, entitled 'Sozialverhalten von Grevyzebras in Zoologischen Gärten' (Social Behaviour of Grevy's Zebra in Zoological Gardens), is based on observations of six groups, both single sex groups and

mixed groups, with regard to relationships between individuals in relation to age class, mare-foal bonding, time budgets in relation to age class and the influence of husbandry routines on behaviour. Ulrike is now writing part of the forthcoming husbandry guidelines for Grevy's Zebra based on this work.

This research allows a greater awareness of the behavioural requirements of Grevy's Zebra and provides a valuable guide to the most appropriate group composition when planning transfers or establishing new groups. For example, observations show that, when kept as a pair, the female will try to be close to the male; whereas males generally maintain a greater distance where possible, resulting in undesirable tension between the two animals. It is recommended that, wherever possible, Grevy's Zebras should no longer be kept as pairs. If there is only room for two animals, then a single sex group is more appropriate (preferably males).

There have been exchanges of over half of the original males which established the bachelor group at Cologne Zoo, without serious problems. A much older male (eight years of age) which was introduced took four months to integrate, as he had been separated for a long time and lacked social competence. It was also possible to introduce a male of just over one year without mishap; he was, in fact, 'adopted' by one of the older males. The new bachelor group at Edinburgh – with three males from two different zoos – has also proved easy to manage.

iv) Eelmoor Marsh

1997 was a very busy year for the Eelmoor Marsh Site of Special Specific Interest (SSSI) project. Tim Woodfine continued his PhD studies and, with the award of an annual budget from the Defence Evaluation and Research Agency to carry out the objectives of the management plan, it was possible to bring in specialists to carry out surveys of a number of animal and plant groups to see what impact grazing by the Przewalski's Horses and Highland Cattle is having. Butterflies and Dragonflies, Moths, Coleoptera and Hemiptera, Spiders, Bryophytes and Fungi were all surveyed; all the data is entered into Recorder, an English Nature database designed to maintain such records for SSSIs.

One of the many notable finds was that of Nail Fungus (*Poronia punctata*). It is endangered on the British list and is possibly the rarest fungus in Europe. This is because it requires specialised circumstances in which to grow – it grows on the dung of horses which graze open acid grassland and may even be restricted to the hardier breeds of horse and pony. It is now largely confined to the New Forest in the UK and occurs in only a few places in south-east Europe. It would also appear that Przewalski's Horses create the ideal conditions for such a rare fungus!

v) Tunisia

Following on from the request to identify Scimitar-horned Oryx for further release programmes in Tunisia, as

reported in the 1996 annual report, I had the opportunity to go there in June and visit both existing (Bou Hedma National Park) and proposed (Sidi Toui National Park, Djebil National Park) release/reintroduction sites for Sahelo-Saharan Antelope and Gazelle in the country. I accompanied Dr. Tommy Smith, who is working on behalf of the Convention on Migratory Species, and Dr. Koen de Smet of the IUCN/SSC Reintroduction Specialist Group (RSG). Our brief was to report on the present situation at each site and recommend the actions necessary for the projects to meet the internationally recognised guidelines for reintroductions as laid down by the RSG. Financial and technical support could then be identified and donor organisations approached. We were greatly assisted by the Direction Générale des Forêts in Tunis and were accompanied by Mr. Kamel Ktaifi from that office to help make the appropriate contacts in the field.

Bou Hedma National Park

Bou Hedma was initially designated as a national park for the relict population of the tree *Acacia tortillis*, a once widespread tree species. The park consists of five sections, of which sections one and three are fenced. Section one is the largest fenced area (2,000 ha) and demonstrates very well the ability of desert vegetation to recover when protected from over-use by domestic livestock. The species introduced in this section are Scimitar-horned Oryx, Addax, Mhor's Gazelle and Ostrich. Dorcas Gazelle and Barbary Sheep also occur naturally in the area.

On arrival at Bou Hedma, we were introduced to the park staff and were given a presentation of the present situation and future plans for the park. The administrative buildings within the park include the Ecomusée, which a German NGO will provide assistance to develop as an educational centre – currently some 2,000 school children and a further 2,000 students and adults visit the park annually. Near to the Ecomusée are a number of enclosures – the original enclosures built to acclimatise the Oryx and Addax, as well as some small pens where several species are being held for display purposes: Scimitar-horned Oryx, Addax and two small groups of Barbary Sheep of different sub-species (*Ammotragus lervia sahariensis* and *A. lervia fassini*).

Overall, of the released species, the Scimitar-horned Oryx have shown greatest increase, growing from a group of ten (five males and five females) imported from the UK in 1985 to eighty-one in June 1997. Addax have also increased, but more slowly, and now number fifty-one. In the early years, there were problems of interspecific aggression between the Oryx and Addax, and the birth of a number of hybrids, known as Orydax. Four (2.2) Orydax have been born to date; two male Orydax remain and are housed in the small enclosures by the bourg. They look very much like a Scimitar-horned Oryx, but are paler in colour and more heavily-built. This resulted in some Addax being transferred to section three of the park.

Sidi Toui National Park

This has been proposed as a new release/reintroduction area for Oryx. The park was fenced five years ago to keep out livestock and the vegetation cover is good. There is also a ready-built acclimatisation area, with a 5 ha enclosure and an adjacent smaller holding area with four pens. With some modifications, this could be used to socialise a group of Oryx coming from different zoos before their release into the park.

In the late afternoon, we made a trip into the park and saw Dorcas Gazelle. At the acclimatisation site, a young male Slender-horned Gazelle, about three months old, was being hand-reared. Hair samples from this animal could provide valuable DNA profile for this species (which is believed to have two sub-species), as he is from a known wild location.

Djebil National Park

This is another extremely important potential reintroduction site for Sahelo-Saharan Antelope and Gazelle. The total area of the park is 1,500 sq.km (150,000 ha), of which 6,000 ha are desert steppe; the rest is erg (dunes). The boundary of the desert steppe zone has been demarcated on three sides by posts; the southern side borders the erg zone. Although it is not fenced, being so far from the main agricultural areas, the vegetation cover is good. The habitat is suitable for Scimitar-horned Oryx, Addax and Slender-horned Gazelle (the latter are known to occur in the erg zone). Even within the erg there is vegetation between the largest dune complexes.

Sahelo-Saharan Antelope and Gazelle Workshop

A workshop on Sahelo-Saharan Antelope and Gazelle projects is to be held in Djerba in Tunisia next year. The workshop will include delegates from all North African countries which were historic range for six Antelope and Gazelle species – Scimitar-horned Oryx (*Oryx dammah*), Addax (*Addax nasomaculatus*), Dorcas Gazelle (*Gazella dorcas*), Slender-horned Gazelle (*Gazelle leptoceros*), Cuvier's Gazelle (*Gazella cuvieri*) and Dama Gazelle (*Gazella dama*).

vi) REGASP

Collection planning is central to good zoo and aquarium management. We took the first steps towards developing a collection plan, using the new software developed by the Australasian Regional Association of Zoological Parks and Aquariums (ARAZPA). REGASP (Regional Animal Species Collection Plan) is designed to integrate both global and regional recommendations for particular species with the individual wishes of participating zoos and has been adopted by ISIS as their chosen collection planning tool. Each zoo using REGASP is able to look at the preferences of every other participating collection, thus offering a very efficient means to communicate institutional collection planning decisions to other collections holding the same species. It will also be an

invaluable tool to those developing regional or global strategies for particular taxonomic groups.

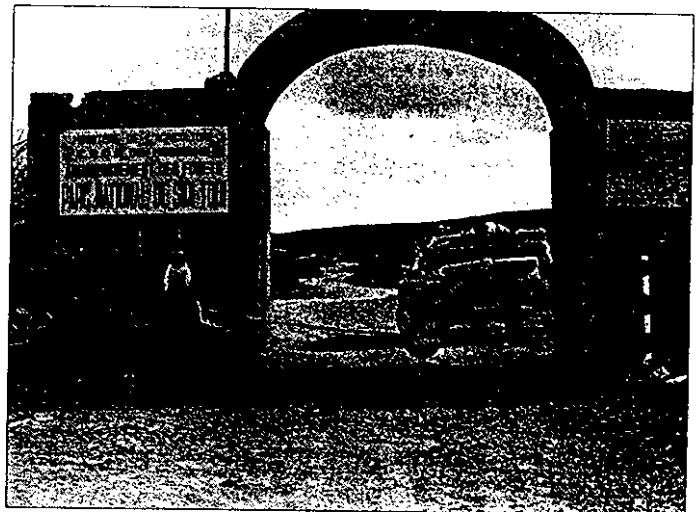
vii) Research Assistant

1997 was the first year in which a graduate student was able to work alongside the Biologist as a beneficiary of an award from the Trust. Nichola Roddis joined after graduating with an MSc in Ecology from Bangor (her research project looked at feeding preferences in the Przewalski's Horses at Eelmoor Marsh). This award will continue to be made on an annual basis, with additional funding from DERA, in view of the administration taken on for the Eelmoor Marsh SSSI project.

Biologist's specific responsibilities:

- ☐ Studbook keeper for Grevy's Zebra (*Equus grevyi*) (International), Scimitar-horned Oryx (*Oryx dammah*) (European), Addax (*Addax nasomaculatus*) (British Isles) and Sable Antelope (*Hippotragus niger*) (British Isles)
- ☐ European Endangered Species Programme (EEP) co-ordinator for Grevy's Zebra (*Equus grevyi*) and Scimitar-horned Oryx (*Oryx dammah*)
- ☐ United Kingdom representative on the Przewalski's Horse (*Equus przewalskii*) EEP Committee
- ☐ Chair of the EEP Equid Taxon Advisory Group
- ☐ Member of the EEP Antelope Taxon Advisory Group
- ☐ Member of DERA Conservation Group and co-ordinator of Przewalski's Horse project at Eelmoor Marsh SSSI
- ☐ Member of the Small Population Management Advisory Group, Research Group and Conservation and Management Committee of the Federation of Zoological Gardens of Great Britain and Ireland
- ☐ Facilitator of behavioural studies, including behavioural enrichment and student projects at Marwell

SIMON WAKEFIELD



Simon Wakefield at the entrance to Sidi Toui National Park

Photo: Renata Molcanova

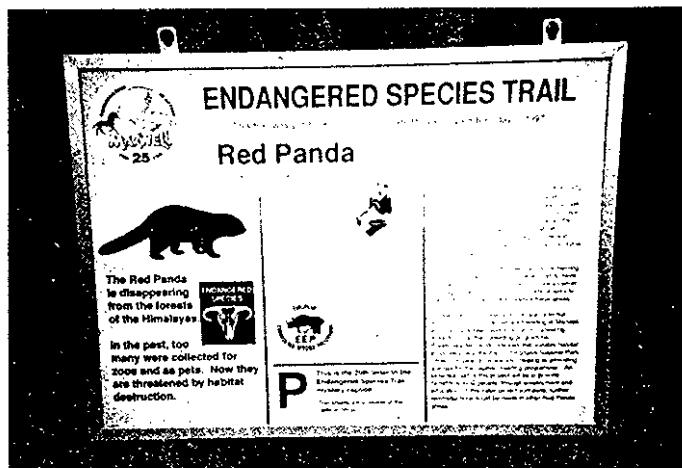
THE EDUCATION SERVICE

Marwell's Anniversary Year will go down in the Education Department's archives not only as a celebration of the past but also as a year of exciting new beginnings. 1997 focused on the need for a new Education Centre with such resolution that the dream is finally about to turn to reality. Although the new Education Centre still, as I write, exists only on paper, a generous recognition of our work by a European Fund, KONVER, means that the building will soon be taking shape.

Many of those reading this report will be well aware of our need for purpose-built, year-round accommodation. That need was underlined this year by a record-breaking attendance of school children and students (over 28,000), stretching our space, resources and energy to their limits. Contributing to this figure, A-level day courses have continued to grow in popularity, keeping us very busy in Spring Term and the first half of the Autumn Term. Colleges like to visit during this period and we are happy to accommodate them at a time when there is less demand from primary and secondary schools. We look forward to welcoming even more A-level groups when our new Education Centre enables us to teach in the second half of the Autumn Term. Our present classrooms are, as you may know, buried under Santa's Grotto at that time of year!

A repeat of our popular 'Behind the Scenes' day for adults and similar twilight events for teachers were held in spring and summer respectively, and a pair of day courses looking at 'The Ecology and Conservation of Carnivores' were run in conjunction with the Department of Adult Continuing Education (Southampton University). A new building should also give us more opportunities to expand our adult education and teachers' INSET provision.

Our Education Volunteer team was a tremendous help, as ever, in our efforts to reach all Marwell's visitors. They spread the conservation message to many through Animal Handling sessions (for over 10,000 visitors), enclosure talks, guided tours and the touch table, as well as making outside visits to schools and libraries. Painted faces, with fact sheets to match, have enhanced visits and raised funds



One of the twenty-five Endangered Species Trail boards produced as part of Marwell's celebrations

Photo: Sally Millar

for the new Education Centre. Both staff and volunteers were involved in several special events during the year. Okapi Week at Easter introduced visitors to this little known species, highlighted its conservation needs and also raised money for the Okapi Wildlife Reserve at Epulu in the Democratic Republic of Congo, which had been caught up in the civil war. Other events, including the Big Birthday Week itself, saw Volunteers working hard to raise funds for the new Education Centre. More Volunteers have been recruited and will be trained early in 1998. Refresher training for those already in the scheme is also planned for the spring.

Two major sets of graphics have been completed during the year. Firstly, the interpretive graphics for the new Penguin World were designed and painted in-house. A subsequent study of visitor use of the 'question and answer' graphics in the covered viewing area was very encouraging. Thanks are due to Julie Cottam (Education Volunteer) for her hours of patient observation. The results of this survey were later presented at the European Zoo Educators' Conference (see *overleaf*). Secondly, Clare Sulston masterminded the production of a series of graphics forming an Endangered Species Trail, which were produced to coincide with Marwell's 25th Anniversary celebrations. The trail, which can be used by schools as well as general visitors, involves a quiz sheet, which encourages participants to answer questions based on the information given by the graphics. Following the departure of Paddy Weeks early in 1997, three freelance artists have contributed to various graphics projects, including identification boards, further graphics for Encounter Village and an interpretive board for the Leaf-cutter Ants.

We have continued to update and add to the written resources we produce, aided by the purchase of two new computers. We have begun the process of transferring work from our ageing Archimedes system to Windows 95, with the much appreciated help of Steve Sagrott (Education Volunteer). The new system should ultimately



Carole Pritchard, an Education Volunteer, gives one of her popular enclosure talks to members of the public by the Meerkats

Photo: Sally Millar

result in our being able to streamline our graphic design and production process.

During the Summer Term, sadly, we said goodbye to Linda Turner, but were pleased to welcome Kerry Bailey, who ably stepped into the breach. Kerry first came to us as a student helper in 1996 and, having shown herself to be not only reliable and enthusiastic but also a very capable teacher, was formally employed by the Trust following her graduation. Sue Crane returned for her fourth year as our temporary summer teacher, working part-time to enable us to cope with the busiest days.

In-house training for Kerry and updating for Jo Gore, who had rejoined us at the beginning of the year, was augmented by attendance at several meetings and conferences. Jo and I were delighted to attend the European Zoo Educators' Conference at the Alpenzoo in Innsbruck, which produced a very useful exchange of ideas, especially with regard to materials and methods used for graphics. Anita, Clare, Paula and Kerry attended the British Zoo Educators' Conference at Chester Zoo

in November. Topics discussed included the use of live animals in the zoo classroom. We have also sent representatives to the Hampshire Environmental Educators' Group meetings whenever possible.

The above opportunities to attend conferences are much valued, and we are grateful for the support of the Director, Trustees and the Education Advisory Committee, both in this context and for our work as a whole. I am also very happy to report that the invaluable financial and advisory support we receive from Hampshire Education Authority has continued and that, following local government reorganisation, grants have also been received from the newly formed Southampton and Portsmouth Education Authorities.

Lastly, my sincere thanks go to my colleagues, Anita Middleton, Clare Sulston, Paula Harwood, Jo Gore, Kerry Bailey and Doreen Foster – and, of course, the Education Volunteers – for their hard work throughout this busy year.

SALLY MILLAR (Head of Education)

EDUCATION CENTRE ANIMAL COLLECTION 1.1.97 to 31.12.97

COMMON NAME	SCIENTIFIC NAME	GROUP 1.1.97	ARRIVED	BORN	NEO-NATAL DEATH	DEATH	DEPARTED	GROUP 31.12.97
STYLOMMATOPHORA								
African Land Snail	<i>Achatina marginata</i>	0.0.35	—	* 0.0.100	—	—	* 0.0.108	* 0.0.27
PHASMIDAE								
Thorny Stick Insect	<i>Eurycanthus horridum</i>	3.9.0	—	* 0.0.110	—	* 0.0.12	* 0.0.48	* 8.19.50
Macleay's Spectre Stick Insect	<i>Extatosoma tiaratum</i>	* 10.30.15	0.4.0	* 0.0.247	—	* 0.0.50	* 0.0.20	* 28.58.150
ANURA								
African Clawed Toads	<i>Xenopus laevis</i>	8.8.0	1.2.0	—	—	1.0.0	—	8.10.0
	<i>Xenopus borealis</i>	—	1.9.0	—	—	—	—	1.9.0
Natterjack Toad	<i>Bufo calamita</i>	5.6.0	—	* 0.0.16000	—	1.0.0	* 0.0.16000	4.6.0
SAURIA								
Leopard Gecko	<i>Eublepharus macularius</i>	0.14.0	—	—	—	0.1.0	0.1.0	0.12.0
Sand Lizard	<i>Lacerta agilis</i>	+ 9.16.22	—	‡ 0.0.147	‡ 0.0.25	3.2.1	‡ 0.0.122 2.14.20	4.0.1
SERPENTES								
Royal Python	<i>Python regius</i>	3.0.10	—	—	—	—	—	7.1.5
Rainbow Boa	<i>Epicrates cenchria</i>	0.2.0	—	—	—	—	—	0.2.0
Red-tailed Boa Constrictor	<i>Boa constrictor</i>	0.0.1	—	—	—	—	—	0.0.1
Bull Snake	<i>Pituophis melanoleucus sayi</i>	0.3.0	—	—	—	—	—	0.3.0
Corn Snake	<i>Elaphe guttata guttata</i>	10.4.0	—	—	—	—	—	10.4.0
RODENTIA								
Rat	<i>Rattus norvegicus</i>	9.7.0	1.0.0	3.2.0	—	7.4.0	1.0.0	5.5.0

* Estimated number † Wrongly estimated in 1996 ‡ Off-site (see report)

REDDISH BUFF MOTH

1997 Breeding Project

Because of the success of 1996, Marwell's Moth Garden was built bigger and better for 1997, in the hope that this too would be a good year. Unfortunately, Marwell's Reddish Buff Moths failed to follow in the footsteps of their predecessors to produce a large number of larvae for release.

With 60 pupae leaving Marwell to take up residence at Paignton and Cricket St. Thomas, this should still have left enough to emerge, mate, lay eggs and produce another 1,600 larvae. Everything went well until the weather decided to have a tantrum. The cold weather at the end of May and in early June halted the emergence of many of the moths. Of the remaining 115 pupae bedded down for May 1997, only 32 moths decided to brave the weather. The females emerged first and had to wait a week before seeing a male; once the males started to show their faces, there was no stopping them, and more and more males emerged. Spoilt for choice, the ladies started to lay their eggs; unfortunately, the cold weather took a hold again and the females stopped laying and the remaining moths failed to emerge. They may appear next year.

Some of the eggs were starting to hatch; the others were waiting for warmer weather. That warmer weather arrived just in time – and 'better late than never'. More larvae appeared in the tents and it looked like being a long season – and not such a bad one after all.

With careful nurturing, a total of 200 larvae hatched and have now pupated. These will be used as the captive stock for May 1998. No release took place this year, as the cold weather had a bad effect on all captive-bred stock, but we are hoping for better results next May.

The sites where the larvae were released last year have been light-trapped and, unfortunately, no moths were found at the Island release site. I am very pleased to say that moths were found at the Hampshire release site and later the caterpillars were seen. This site is to be grazed, fencing erected and a water supply pumped through. A grant has been allocated by English Nature and the Environment Agency have also contributed (via Marwell) towards the fencing and plumbing. The moths at the already established Isle of Wight site are still faring well and many moths have been light-trapped. The donation from Marwell's Moth Supporters has helped greatly in keeping this site managed.

The 4th Moth Awareness Day was combined with our Gardening Weekend and experts from Butterfly Conservation gave valuable advice on which plants to grow to attract butterflies, moths and other wildlife to the garden. Many exciting moths were trapped on the Friday night, amongst others were the Eyed Hawkmoth, Lime Hawkmoth, Elephant Hawkmoth, Green Silver Lines, Buff Tip, White Ermine and Mottled Beauty. The Moth Awareness Day certainly brought Moth Awareness to an unsuspecting public!

MICHELE WALTON

(Reprinted from Marwell Zoo News, Autumn/Winter 1997)



Ankole with calf
Photo: John Roden



Close encounter ...
White Rhino
'Kiri'
Photo: Gus Malcom



Sand Lizard and Natterjack Toad Project

1997 Breeding and Release Report

No Sand Lizards were bred at Marwell during 1997. This was because the breeding colony had to be temporarily rehoused for the year in other vivaria, where most did actually breed. The move was necessary as I spent the summer in Belize, working on a project to establish a tropical forest reserve (*the Education Centre has a supply of leaflets for those who want more information*). The Natterjack Toads, which require less time to keep them happy, stayed at Marwell, where they were looked after by John Buckley, the Herpetological Conservation Trust Amphibian Officer.

The Sand Lizards remain Marwell stock, however, and the 1997 breeding results are therefore summarised here. The elderly adult lizards came through the winter fairly well and only two females did not emerge in April. It seems as though breeding is much more stressful than hibernation for the old females, hence the larger losses during the summer of 1996. Three of the adult males also disappeared during hibernation, although they were all over twelve – a ripe old age for a Sand Lizard. The eighteen hatchlings retained over winter did well, however, and all but one survived.

As soon as the lizards had appeared in the spring, they were distributed to four of the other five British Herpetological Society vivaria which house Dorset stock. This was done as early as possible, to avoid moving lizards once breeding had started. Two males went to a breeder in London who only had female lizards. One adult and two immature females were housed with a breeder in the New Forest. The Holidays Hill reptiliary, near Lyndhurst, had four adult females. Finally, Nature Quest

took nine adult females and a pair of immature lizards for its display vivarium. The Nature Quest lizards will be returned to Marwell during the spring of 1998, along with the animals already living in their vivarium (which is to be closed).

Sixteen of the hatchlings were also liberated at the East Hampshire release site in April. Four male lizards were kept at Marwell, two in the display vivarium and two in the main enclosure, along with the last hatchling, which I couldn't catch!

A total of 147 hatchlings were produced in 1997 by the fourteen adult female Marwell Sand Lizards living elsewhere for the year (10.5 per female). Detailed clutch results were not available. Bearing in mind that the 'Marwell' hatchlings were mixed with those from other females for rearing, the following release numbers are estimates only. During September, thirty hatchlings were released on a Dorset site (first year), sixty-five on another East Hampshire heath (first year) and twenty-seven into a New Forest enclosure (third year). For some reason, twenty-five hatchlings also died before release.

The Natterjack Toads at Marwell had a very good year, with four large, healthy spawn strings being produced – two in April and two in July. John Buckley estimated that over 16,000 tadpoles resulted from the spawn. All were released at two existing heathland reintroduction sites in Surrey. Both sites are being grazed with cattle, which seems to be a crucial factor for a successful Natterjack colony. One adult male, which had never done well, died at Marwell in 1997, but the remaining toads are thriving and it is hoped that all six females will breed in 1998.

PAUL EDGAR (Project Co-ordinator and
Hampshire Heathlands Project Officer)



NUTRITIONAL RESEARCH

The Marwell Preservation Trust is supporting research into the vitamin E requirements of two endangered Perissodactyls, the Black Rhino (*Diceros bicornis*) and Przewalski's Horse (*Equus przewalskii*). The background to these studies was set out in the 1996 annual report.

During 1997, preliminary field work was completed, developing suitable methods of studying diet selection and monitoring the dietary intake of these animals. Trial

vegetation sampling and laboratory procedures were also completed, resulting in successful determination of vitamin E in natural forages.

The Eelmoor Marsh project facilitates the dietary studies of semi-free-ranging Przewalski's Horses. The aim of field work throughout 1998 is to use the methods developed over the last year to monitor vitamin E intake by these animals. This will yield valuable baseline information

about naturally-occurring levels of the nutrient and produce a model of seasonal variation. However, it is not simply a case of monitoring vitamin E levels in grass. Studies at Eelmoor Marsh have revealed that diet selection changes during the year, both spatially (i.e. different areas are grazed preferentially at different times) and at the level of the individual food item (i.e. different plants and even parts of those plants are utilised at different times). There are other factors that further complicate the model and need to be investigated. For example, the level of grazing pressure may improve the vitamin E status of the vegetation by promoting photosynthetic activity or even have a negative effect by damaging the plants in the sward.

Because of the (relative!) ease of observing the animals, Eelmoor Marsh provides a unique opportunity to test a number of hypotheses regarding the patterns of vegetation use and the effects on vitamin E intake. However, unimproved grasslands in the UK are not the historical natural habitat of the wild horse and comparative data with vegetation from the Eurasian steppe is required. The opportunity to do so has been provided by Marwell's involvement in the release of Przewalski's Horses into the Pentzug Pusztas Steppe Reserve in Hungary during 1998. A visit to Hungary is planned at the end of May, to collect vegetation samples following the release of Makan (from Eelmoor Marsh) and his harem.

Simon Wakefield's Equid TAG Space Survey provided an opportunity to question around two hundred European zoos that have wild equids in their collection about dietary regimes and possible cases of vitamin E deficiency. The response has been excellent – to date over 110 zoos have replied, providing an invaluable database. Reports of possible vitamin E deficiency problems have not been confined to Przewalski's Horses; disorders have been reported in other wild equids, including Somali Wild Ass. The exercise has proved so successful that a second questionnaire aimed at Rhino is in preparation.

Black Rhino

Black Rhino dietary studies have been carried out during two visits to the Chipangali Wildlife Orphanage in Zimbabwe. Studying Black Rhino diet in the wild is a tricky business. Their shy nature and habitat preference for dense thickets, which provide both food and shelter, mean that information on diet for this species cannot be based purely on direct observations and must rely heavily on evidence of browsing. In some cases (e.g. where herbs are selected), the entire plant may be eaten, leaving no evidence of feeding. These problems are overcome working with the Chipangali Black Rhino. Studies are carried out under controlled conditions, where direct observations of diet selection is possible. This is also important for estimating total dietary intake. Once the diet and total intake are known, appropriate vegetation samples can be collected and analysed to determine daily intake of specific nutrients. Field work methods developed in 1997 and the results of diet selection studies will now be applied to determine vitamin E intake for the Chipangali Black Rhino. Both wet and dry season studies

are planned to account for natural seasonal variations in nutritional status.

A second advantage of working with the Chipangali Black Rhino is the potential for taking blood samples without the need for immobilisation of the animals. To date, physiological parameters for Black Rhino consuming natural forages have been gained on an opportunistic basis, i.e. during capture/translocation operations. The process of chasing and immobilising the animal will induce oxidative stresses that will use up antioxidants like vitamin E in the body. Determining physiological norms in unstressed animals as a direct comparison to known dietary intake will help in evaluating nutritional status of Black Rhino. A research permit from the Zimbabwean National Parks Board is expected to enable this further work to go forward in 1998.

One of the original objectives of this research was to evaluate the current nutritional status of zoo animals and to look for any significant differences between them and their counterparts consuming natural forages. A preliminary diet and food intake assessment of Black Rhino was undertaken at Whipsnade Wild Animal Park in 1997. Follow-up studies are planned in 1998, with laboratory analysis of forages, to determine vitamin E intake. It is hoped that blood samples from routine clinical tests can be used to evaluate vitamin E status in these animals.

Unlike wild equids, which are primarily grazers and can be maintained successfully on pasture, Black Rhino derive their natural diet from browsing trees and shrubs. Many of their nutritional requirements cannot be supplied through traditional zoo diets, which are often based on requirements of domestic horses. Some work has been carried out in North America and Australia, to look at the nutritional composition of local browse species, to test their suitability for feeding Black Rhino. To date, no such studies have been carried out in Europe. Last year a small number of plants native to the UK were identified as potentially suitable candidates and chemical analysis is planned.

Black Rhino nutrition is a major concern of all organisations involved in the conservation and captive breeding of the species. To complement the vitamin E studies, collaborative work has now begun with the Department of Nutrition at the Wildlife Conservation Society, New York. The aim of this additional research is to determine Black Rhino requirements for other vitamins, essential minerals and fatty acids. Vegetation and blood samples will be processed initially in the Dambari Field Station laboratory, before export to New York for chemical analysis.

We are also issuing a plea for Rhino blood and tissue samples (of any species) from European zoos to be sent to WCS for analysis, to help build a better all-round picture of nutritional parameters.

*TIM WOODFINE
(Conservation Research Associate)*

Marwell Zimbabwe Trust

DAMBARI FIELD STATION

Report for 1997

New enclosures

Four very large new Duiker enclosures were erected with treated gum poles and diamond mesh fencing. Material was purchased and six large gates were made at the Duiker Station, covered with wire and fitted. All gates were painted and a large curved asbestos hut erected in each Duiker enclosure for the Duikers to hide in and get shelter during bad weather.

A concrete floor was laid in each asbestos hut and the bottom of the diamond mesh fences were embedded into concrete. This was to prevent any vermin or dogs from digging under the wire and getting into the enclosure.

Repairs and maintenance of existing Duiker enclosure

New asbestos roofing sheets were purchased and new roofs were erected on all the small buildings in the various Duiker enclosures. In most cases, the old damaged asbestos sheets were removed and discarded.

Gates in all the enclosures were painted and small buildings repaired. New shade cloth was also used to

replace old, damaged shade cloth areas.

The fences were fixed where necessary and all the enclosures brought up to a high standard.

Reshuffle of Duikers

In order to sort out and place Duikers in the four new enclosures, a complete reshuffle of all the Duikers at the centre was essential. The most important aspect that had to be taken into account was what to do with all the surplus male Duikers. As these animals are extremely territorial, not more than one male could be kept in an enclosure with females.

This was discussed with Mr. John Knowles, who felt that a large group of 'males only' should be placed in one enclosure. Unfortunately, because of territorial contests, some aged males were lost. Several Blue Duikers were original animals obtained over twelve years ago and were therefore extremely old.

In addition, five adult male Common Duikers were released into the large fenced game park, which helped relieve pressure on the breeding enclosures. A detailed list of all Duikers now on the station is as follows:

DUIKER COLLECTION 1.1.97 to 31.12.97

COMMON NAME	SCIENTIFIC NAME	GROUP 1.1.97	ARRIVED	BORN	NEO-NATAL DEATH	DEATHS/RELEASES	GROUP 31.12.97
Blue Duiker	<i>Cephalophus monticola</i>	12.13.0	—	—	—	5.2.0	7.11.0
Maxwell's Duiker	<i>Cephalophus maxwelli</i>	4.3.0	—	2.0.0	—	4.1.0	2.2.0
Red Duiker	<i>Cephalophus natalensis</i>	4.2.0	—	1.0.0	—	2.0.0	3.2.0
Yellow-backed Duiker	<i>Cephalophus sylvicultor</i>	2.1.0	—	—	—	—	2.1.0
Black Duiker	<i>Cephalophus niger</i>	1.0.0	—	—	—	—	1.0.0
Bay Duiker	<i>Cephalophus dorsalis</i>	3.0.0	—	—	—	1.0.0	2.0.0
Grey Duiker	<i>Sylvicapra grimmia</i>	15.14.0	—	—	—	5.0.0	10.14.0



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We are most grateful to the following for financial or practical help:

- Environment Agency – for £500 donation to the Reddish Buff Moth project and for the donation of four Evergreen Oaks
- S. & J. New – supply of diesel for the Marwell rail train
- Fort Dodge – for the supply of vaccines and veterinary pharmaceuticals
- Brambridge Park Gardens – £750 for planting round new Gift Shop
- British Airways Assisting Conservation – for providing valuable support by transporting zoological personnel
- S.J.D. Humphrey Holdings Limited – £375 for Easter Eggstravaganza
- Southampton City Council – animal adoption
- Hart District Council – animal adoption
- Uni-Rents – for free hire of equipment
- AXA Equity and Law – for a donation of £940 in support of the Rhino breeding programme
- (TA Tigers) Territorial Army, Portsmouth – for their help in constructing a network of platforms in the Siberian Tiger enclosure
- Winchester Motor Company – sponsors of the Marwell 10K Road Race for the fifth year
- Alan Hold and Phil Budd of Butterfly Conservation – for running a moth trap in the grounds of Marwell followed by a display of moths to visitors to Moth Awareness Day
- DERA – for the Przewalski's Horse project
- Portsmouth Joggers Club – for their help in organising the Marwell 10K Road Race
- Raleigh International – for various projects around the Park

We are most grateful to:

- David Whitehead
for keeping our computers under control
and to Malcolm Laing
for maintaining our web site
- All those who choose Marwell as a fitting place
to remember loved friends and relations
with a dedicated bench
- All who make donations, whether it be
a gift of children's pocket money
or a larger amount



EXTERNAL FUNDING

We are most grateful to the following bodies for their continued support:

- Hampshire County Council
(Education Authority) £47,918
- City of Portsmouth (Education grant) £4,800
- Winchester City Council has, as in previous years,
forgiven us that portion of the National
Non-Domestic Rate, which is not subject to
the mandatory relief for a registered charity
- The Margaret Misselbrook Discretionary Trust £200
- The Richard Kirkman Trust £500

25th Anniversary Sponsors

- Appleton Signs Limited – £500 for exhibition panel
- Associated British Ports – £2,500 for Seminar
- Conder Structures Limited – Anniversary edition of Zoo News
- Eldertons Press Limited – Anniversary edition of Zoo News
- Howard Davies Paper – Anniversary edition of Zoo News
(supply of paper)
- Henderson Administration – £250
- Hepherd Winstanley and Pugh – £250 for Penguin World
- Hendy Leisure – £500 for exhibition panel
- IBM UK – £100
- Manor Bakeries Limited – £200
- Mazuri Zoo Foods – £500 for exhibition panel
- Ordnance Survey – £500 for exhibition panel
- P. Trant Limited – £200 for Seminar
- William Wheatley of Wickham – £500 for exhibition panel
- Willis Corroon Limited – £500 for exhibition panel

Thanks also go to the following consultants and advisers to the Trust:

- Colin Bashford Associates Limited
Ian Judd and Partners
Radley House Partnership

LEGACIES

The Trust was the grateful beneficiary of the following legacies:

- Dorothy Barlow (£1,000)
Constance Mary Bennett (£400)

A legacy could be your lasting contribution to the welfare of
your fellow-beings on our planet – granting continuation to
the ever more necessary work of conservation and education.

ADOPTION SCHEME

The Adoption Scheme again played a vital role in the funding of Marwell's work, providing funds of £76,735.

We are grateful to every adopter, whether they support us with a children's adoption, with help for the Moth project or with the adoption of a Rhino. Adoptions come in all shapes and sizes, and are often given as presents to show the adopter that they are loved or to say 'thank you'. An adoption provides a link with Marwell and a favourite animal that is both personal and unique.

The 'specials' have once again proved very popular. The Valentine adoption was changed from a Chinchilla to a Chocolate Millipede – the slimmer's kind of chocolate! 'Sula' adoptions continued to prove that you can get a Rhino in a Christmas stocking.

The Children's Adoption Scheme continues to give children a special interest in wildlife and it has been found that many children have become very protective of 'their' animal.

We welcomed the adoption of a Giraffe by John Cleese, star of the film *'Fierce Creatures'*, during filming for the television series *'Rolf's Amazing Animals'*.

Schools, Guides, Brownies, Scouts and Cubs all demonstrate their care and concern for the world's wildlife by working to raise money for their animal adoptions. Everyone can be fitted into the Adoption Scheme!

The Reddish Buff Moth project attracted supporters of all kinds. £467.50 was given to the Isle of Wight Volunteers.

Among our valued substantial commercial adopters during 1997 were:

- ★ Ace Office Supplies
- ★ Animed Veterinary Hospital
- ★ Booth Museum of Natural History
- ★ Brookfield Hotel
- ★ Cos-tec Limited
- ★ David Deane Wardrobes
- ★ Dutton Gregory and Williams
- ★ Guardian Insurance
- ★ Howard Davies Paper
- ★ John Lewis Partnership
- ★ KPMG
- ★ Lawnswood Limousines
- ★ Lemur Software
- ★ Llamasoft Software
- ★ Lynx Distribution Network
- ★ Marsh Plant Holdings
- ★ Petersfield Post
- ★ r2b2 Computer Consultants
- ★ Rees Geophysical, Oman
- ★ Royal Mail, Southampton
- ★ Sealink Stena Line
- ★ Security and Sign Services
- ★ Shield Veterinary Centre
- ★ Shoosmiths and Harrison
- ★ Soper Software
- ★ Topsail Limited
- ★ Veterinary Investigation Centre
- ★ Webb's Country Foods
- ★ Winchester Motor Company



A Siberian Tiger playing with a log
Photo: Gus Malcom

MARWELL ZOOLOGICAL PARK

ANIMAL COLLECTION 1.1.97 to 31.12.97

COMMON NAME	SCIENTIFIC NAME	GROUP 1.1.97	ARRIVED	BORN	NEO-NATAL DEATH	DEATH	DEPARTED	GROUP 31.12.97
MAMMALS								
MARSUPIALIA								
Kowari	<i>Dasyuriodes byrnei</i>	—	3	—	—	—	—	1.2.0
Bennett's Wallaby	<i>Macropus rufogriseus</i>	38	—	13	2	4	—	22.23.0
Parma Wallaby	<i>Macropus parma</i>	12	—	3	—	1	—	8.6.0
Grey Kangaroo	<i>Macropus fuliginosus ocydromus</i>	4	1	—	—	1	—	1.3.0
PRIMATES								
Coquerel's Mouse Lemur	<i>Microcebus coquereli</i>	*1 12	—	—	—	3	1	2.6.0
Ring-tailed Lemur	<i>Lemur catta</i>	12	—	—	—	—	5	2.5.0
Red Ruffed Lemur	<i>Varecia variegata ruber</i>	5	—	4	4	—	—	2.3.0
Black and White Ruffed Lemur	<i>Varecia variegata variegata</i>	3	—	4	4	—	—	1.2.0
Pygmy Marmoset	<i>Callithrix pygmaea</i>	2	2	—	—	—	—	2.2.0
Red-mantled Tamarin	<i>Saguinus fuscicollis illigeri</i>	2	—	—	—	—	—	2.0.0
Emperor Tamarin	<i>Saguinus imperator subgriseus</i>	12	—	9	4	—	2	6.4.5
Cotton-top Tamarin	<i>Saguinus oedipus oedipus</i>	10	—	1	—	3	—	3.4.1
Golden Lion Tamarin	<i>Leontopithecus rosalia rosalia</i>	9	—	—	—	1	1	3.4.0
Golden-headed Lion Tamarin	<i>Leontopithecus rosalia chrysomelas</i>	5	1	2	2	—	2	2.2.0
Goeldi's Monkey	<i>Callimico goeldii</i>	3	1	—	—	1	—	1.2.0
Squirrel Monkey	<i>Saimiri sciureus</i>	8	—	—	—	1	2	1.4.0
Sulawesi Macaque	<i>Macaca nigra</i>	19	—	3	—	4	4	5.8.1
De Brazza's Monkey	<i>Cercopithecus neglectus</i>	5	1	—	—	1	1	2.2.0
Siamang Gibbon	<i>Hylobates syndactylus</i>	5	—	2	1	—	—	4.2.0
RODENTIA								
Prevost's Squirrel	<i>Callosciurus prevosti</i>	—	2	—	—	—	—	1.1.0
Chipmunk	<i>Eutamias sibiricus</i>	*2 1	2	—	—	—	—	1.2.0
Red Squirrel	<i>Sciurus vulgaris</i>	—	2	—	—	1	—	0.1.0
Crested Porcupine	<i>Hystrix cristata</i>	2	—	—	—	—	—	1.1.0
Mara	<i>Dolichotis patagona</i>	14	3	19	7	4	1	15.8.1
Capybara	<i>Hydrochoerus hydrochaeris</i>	4	—	3	—	1	—	3.3.0
Orange-rumped Agouti	<i>Dasyprocta aguti</i>	4	—	4	—	2	—	2.4.0
CARNIVORA								
Maned Wolf	<i>Chrysocyon brachyurus</i>	2	—	—	—	1	—	0.1.0
Bush Dog	<i>Speothos venaticus</i>	3	—	9	3	—	1	3.5.0
Ring-tailed Coati	<i>Nasua nasua</i>	8	1	2	—	1	2	1.7.0
Red Panda	<i>Ailurus fulgens</i>	3	2	—	—	1	—	1.3.0
Dwarf Mongoose	<i>Helogale parvula</i>	3	—	—	—	—	—	1.2.0
Slender-tailed Meerkat	<i>Suricata suricatta</i>	3	2	—	—	—	1	2.2.0
Caracal Lynx	<i>Felis caracal</i>	5	—	—	—	—	1	2.2.0
European Lynx	<i>Felis lynx lynx</i>	2	—	—	—	—	—	1.1.0
Serval	<i>Felis serval</i>	2	2	—	—	—	—	2.2.0
Asiatic Lion	<i>Panthera leo persica</i>	1	—	—	—	—	—	0.1.0
Siberian Tiger	<i>Panthera tigris altaica</i>	7	—	—	—	—	1	4.2.0
Persian Leopard	<i>Panthera pardus saxicolor</i>	2	1	—	—	—	—	1.2.0
Jaguar	<i>Panthera onca</i>	3	1	—	—	1	—	1.2.0
Snow Leopard	<i>Panthera uncia</i>	6	—	5	1	2	2	2.4.0
Cheetah	<i>Acinonyx jubatus</i>	2	1	—	—	—	—	1.2.0

COMMON NAME	SCIENTIFIC NAME	GROUP 1.1.97	ARRIVED	BORN	NEO-NATAL DEATH	DEATH	DEPARTED	GROUP 31.12.97
HYRACOIDEA								
Rock Hyrax	<i>Procavia capensis</i>	2	—	—	—	1	—	1.0.0
PERISSODACTYLA								
Przewalski's Horse †	<i>Equus przewalskii</i>	10	—	—	—	2	—	0.8.0
Kulan	<i>Equus hemionus kulan</i>	5	—	—	—	—	—	0.5.0
Somali Wild Ass	<i>Equus africanus somalicus</i>	3	1	—	—	—	—	3.1.0
Hartmann's Mountain Zebra †	<i>Equus zebra hartmannae</i>	6	3	1	—	2	—	3.5.0
Chapman's Zebra †	<i>Equus burchelli chapmani</i>	5	1	2	—	—	1	1.6.0
Grevy's Zebra †	<i>Equus grevyi</i>	9	—	2	—	—	—	2.9.0
Malayan Tapir	<i>Tapirus indicus</i>	—	3	—	—	—	—	2.1.0
Brazilian Tapir	<i>Tapirus terrestris</i>	2	1	—	—	1	2	0.0.0
White Rhinoceros	<i>Ceratotherium simum simum</i>	3	1	—	—	—	1	1.2.0
ARTIODACTYLA								
Vietnamese Pot-bellied Pig	<i>Sus scrofa</i>	4	—	—	—	—	—	2.2.0
Babirusa	<i>Babyrousa babyrussa</i>	3	—	—	—	—	—	1.2.0
Collared Peccary	<i>Tayassu tajacu</i>	29	—	20	6	2	3	2.10.26
Pygmy Hippopotamus	<i>Choeropsis liberiensis</i>	3	—	—	—	—	—	2.1.0
Llama	<i>Lama glama</i>	3	—	—	—	1	—	1.1.0
Bactrian Camel	<i>Camelus bactrianus</i>	9	—	—	—	—	1	3.5.0
Vicugna	<i>Lama vicugna</i>	6	—	2	2	1	—	2.3.0
Lesser Malayan Chevrotain	<i>Tragulus javanicus</i>	1	5	—	—	1	1	2.2.0
Reeve's Muntjac Deer	<i>Muntiacus reevesi</i>	6	2	3	—	1	2	2.6.0
Axis Deer †	<i>Axis axis</i>	35	—	4	4	5	30	0.0.0
Hog Deer †	<i>Axis porcinus</i>	9	—	—	—	—	9	0.0.0
Barasingha †	<i>Cervus duvauceli</i>	14	—	—	—	3	11	0.0.0
Reindeer	<i>Rangifer tarandus</i>	2	—	—	—	—	—	2.0.0
Chilean Pudu †	<i>Pudu pudu</i>	8	—	4	—	1	1	7.3.0
Okapi †	<i>Okapi johnstoni</i>	3	—	1	—	—	—	2.2.0
Giraffe †	<i>Giraffa camelopardalis</i>	8	—	2	1	—	—	2.7.0
Dwarf Zebu	<i>Bos primigenius</i>	1	1	2	—	—	—	1.3.0
Nyala †	<i>Tragelaphus angasi</i>	9	—	1	—	1	—	2.7.0
Speke's Sitatunga †	<i>Tragelaphus spekei</i>	14	—	7	1	3	—	5.12.0
Greater Kudu †	<i>Tragelaphus strepsiceros</i>	13	—	8	3	2	—	2.14.0
Bongo †	<i>Tragelaphus euryceros isaaci</i>	8	—	2	—	—	—	6.4.0
Lowland Anoa	<i>Bubalus depressicornis</i>	2	—	—	—	—	—	1.1.0
Ankole Cattle	<i>Bos taurus</i>	9	—	7	2	—	—	3.11.0
Congo Buffalo	<i>Syncerus caffer nanus</i>	8	—	1	—	—	—	3.6.0
Ellipsen Waterbuck †	<i>Kobus ellipsiprymnus</i>	10	1	1	1	4	—	1.6.0
Roan Antelope †	<i>Hippotragus equinus</i>	17	—	9	2	—	—	7.17.0
Sable Antelope †	<i>Hippotragus niger</i>	24	—	9	3	6	1	6.17.0
Gemsbok †	<i>Oryx gazella gazella</i>	11	—	7	4	2	—	2.10.0
Arabian Oryx †	<i>Oryx leucoryx</i>	6	1	1	—	2	1	1.4.0
Scimitar-horned Oryx	<i>Oryx dammah</i>	20	—	8	1	3	3	4.17.0
Addax †	<i>Addax nasomaculatus</i>	7	1	2	—	4	—	1.5.0
Arabian Gazelle †	<i>Gazella gazella arabica</i>	16	2	8	6	3	7	1.9.0
Dama Gazelle †	<i>Gazella dama ruficollis</i>	17	—	9	1	3	—	8.14.0
DOMESTIC								
Golden Guernsey Goat	<i>Capra hircus</i>	2	—	—	—	—	—	0.2.0
Nigerian Dwarf Goat	<i>Capra hircus</i>	26	—	5	1	1	12	1.16.0
Guinea Pig	<i>Cavia porcellus</i>	13	1	15	3	3	11	1.11.0
Ferret	<i>Mustela putorius furo</i>	6	1	12	—	—	14	2.3.0
Poitou Donkey	<i>Equus asinus asinus</i>	3	—	1	—	—	—	1.3.0
Exmoor Pony	<i>Equus caballus</i>	2	—	—	—	—	—	0.2.0
Chinchilla	<i>Chinchilla laniger</i>	7	—	5	2	3	1	3.3.0
TOTAL Mammals: 674		682	53	244	71	95	139	220.420.34

COMMON NAME	SCIENTIFIC NAME	GROUP 1.1.97	ARRIVED	BORN	NEO-NATAL DEATH	DEATH	DEPARTED	GROUP 31.12.97
BIRDS								
STRUTHIONIFORMES								
Ostrich	<i>Struthio camelus</i>	2	—	—	—	—	—	1.1.0
RHEIFORMES								
Common Rhea	<i>Rhea americana</i>	38	—	—	—	7	5	14.8.4
SPHENISCIDAE								
Macaroni Penguin	<i>Eudyptes chrysolophus</i>	6	1	—	—	—	1	2.3.1
African (Jackass) Penguin	<i>Spheniscus demersus</i>	22	—	—	—	—	—	0.0.22
CICONIFORMES								
Marabou Stork	<i>Leptoptilos crumeniferus</i>	2	—	—	—	1	—	1.0.0
Caribbean Flamingo	<i>Phoenicopterus ruber ruber</i>	12	—	—	—	—	—	5.2.5
Greater Flamingo	<i>Phoenicopterus ruber roseus</i>	3	—	—	—	—	—	0.3.0
ANSERIFORMES								
Rufus Whistling Tree Duck	<i>Dendrocygna bicolor</i>	6	1	2	2	—	—	3.3.1
Black Swan	<i>Cygnus atratus</i>	6	—	10	—	1	4	2.4.5
Greylag Goose ‡	<i>Anser anser</i>	37	8	—	—	—	—	0.0.45
Northern Pintail	<i>Anas acuta</i>	1	—	—	—	1	—	0.0.0
Ringed Teal	<i>Callonetta leucophrys</i>	4	2	—	—	—	—	3.3.0
European Eider Duck	<i>Somateria mollissima mollissima</i>	4	3	1	—	2	—	4.2.0
Red-crested Pochard	<i>Netta rufina</i>	6	—	2	—	1	—	2.3.2
FALCONIFORMES								
Crested Caracara	<i>Polyborus plancus</i>	2	—	—	—	—	—	1.1.0
Secretary Bird	<i>Sagittarius serpentarius</i>	1	3	—	—	—	1	2.1.0
GALLIFORMES								
Crested Guan	<i>Penelope purpurascens</i>	2	—	1	—	—	—	1.2.0
Satyr Tragopan	<i>Tragopan satyra</i>	5	1	3	2	1	—	2.4.0
Malay Crestless Fireback	<i>Lophura erythrophthalma erythrophthalma</i>	1	2	—	—	—	3	0.0.0
White Eared Pheasant	<i>Crossoptilon crossoptilon</i>	4	—	—	—	—	—	2.2.0
Brown Eared Pheasant	<i>Crossoptilon mantchuricum</i>	2	2	—	—	—	2	1.1.0
Cheer Pheasant	<i>Catreus wallichi</i>	12	—	13	11	5	9	0.0.0
Himalayan Monal Pheasant	<i>Lophophorus impeyanus</i>	4	—	5	3	1	—	2.3.0
Grey Peacock Pheasant	<i>Polyplectron bicalcaratum</i>	4	—	12	2	6	3	2.3.0
GRUIFORMES								
Red-crowned Crane	<i>Grus japonensis</i>	2	—	—	—	—	—	1.1.0
Sarus Crane	<i>Grus antigone</i>	1	2	—	—	—	—	2.1.0
Stanley Crane	<i>Anthropoides paradisea</i>	2	—	—	—	—	—	1.1.0
African Crowned Crane	<i>Balerica regulorum gibbericeps</i>	4	1	—	—	—	1	2.2.0
PSITTACIFORMES								
Sulphur-crested Cockatoo	<i>Cacatua sulphurea</i>	1	1	—	—	—	—	1.1.0
Moluccan Cockatoo	<i>Cacatua moluccensis</i>	2	—	—	—	—	—	1.1.0
Blue and Gold Macaw	<i>Ara ararauna</i>	2	—	—	—	—	—	1.1.0
Scarlet Macaw	<i>Ara macao</i>	2	—	—	—	—	—	1.1.0
Yellow-naped Macaw	<i>Ara auricollis</i>	4	2	—	—	—	—	3.3.0



COMMON NAME	SCIENTIFIC NAME	GROUP 1.1.97	ARRIVED	BORN	NEO-NATAL DEATH	DEATH	DEPARTED	GROUP 31.12.97
PSITTACIFORMES cont.								
Blue-throated Conure	<i>Pyrrhura cruentata</i>	2	—	—	—	—	—	1.1.0
Slender-billed Conure	<i>Enicognathus leptorhynchus</i>	2	—	5	—	1	—	3.3.0
Yellow-fronted Amazon	<i>Amazona ochrocephala</i>	1	—	—	—	—	—	0.1.0
Blue-fronted Amazon	<i>Amazona aestiva</i>	2	—	—	—	—	—	1.1.0
STRIGIFORMES								
European Eagle Owl	<i>Bubo bubo</i>	2	—	—	—	—	—	1.1.0
Snowy Owl	<i>Nyctea scandiaca</i>	1	1	—	—	—	—	1.1.0
CORACIIFORMES								
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	3	—	—	—	—	—	1.2.0
PASSERIFORMES								
Red-billed Blue Pie	<i>Urocissa erythrorhyncha</i>	2	—	—	—	—	—	1.1.0
Azure-winged Magpie	<i>Cyanopica cyanus</i>	2	—	—	—	—	—	2.0.0
DOMESTIC								
Light Sussex Bantam		6	—	—	—	—	6	0.0.0
Buff Orpington Chicken		4	5	—	—	1	2	2.4.0
Speckled Sussex Bantam		—	4	—	—	—	—	1.3.0
TOTAL Birds: 241		233	39	54	20	28	37	77.79.85
REPTILES								
CHELYDRIDAE								
Snapping Turtle	<i>Chelydra serpentina</i>	2	—	—	—	—	2	0.0.0
Red-eared (Slider) Terrapin	<i>Trachemys (Pseudemys) scripta elegans</i>	3	—	—	—	—	—	0.0.3
TESTUDINIDAE								
Leopard Tortoise	<i>Geochelone pardalis babcocki</i>	—	5	—	—	—	—	2.3.0
Asia Minor Spur-thighed Tortoise	<i>Testudo graeca ibera</i>	4	—	—	—	—	—	4.0.0
Hermann's Tortoise	<i>Testudo hermanni</i>	39	4	12	—	—	19	1.8.27
CROCODYLIA								
West African Dwarf Crocodile	<i>Osteolaemus tetraspis tetraspis</i>	2	—	—	—	1	—	1.0.0
CHAMAELEONIDAE								
Jackson's Chameleon	<i>Chamaeleo jacksonii</i>	1	—	—	—	—	—	1.0.0
GEKKONIDAE								
Mauritius Day Gecko	<i>Phelsuma cepediana</i>	6	—	—	—	6	—	0.0.0
Mauritius Day Gecko	<i>Phelsuma guimbeaui</i>	4	—	—	—	2	—	1.1.0
One Lined Day Gecko	<i>Phelsuma lineata</i>	4	—	—	—	1	—	1.2.0
BOIDAE PYTHONINAE								
Green Tree Python	<i>Chondropython viridis</i>	2	—	—	—	1	—	0.1.0
Burmese Python	<i>Python molurus bivittatus</i>	2	1	—	—	1	—	0.2.0
Emerald Tree Boa	<i>Corallus caninus</i>	—	2	—	—	1	—	1.0.0
TOTAL Reptiles: 59		69	12	12	—	13	21	12.17.30



COMMON NAME	SCIENTIFIC NAME	GROUP 1.1.97	ARRIVED	BORN	NEO-NATAL DEATH	DEATH	DEPARTED	GROUP 31.12.97
AMPHIBIANS								
DENDROBATIDAE								
Green and Black Poison Arrow Frog	<i>Dendrobates auratus</i>	7	—	—	—	2	—	5
Yellow-banded Poison Arrow Frog	<i>Dendrobates leucomelas</i>	12	—	—	—	4	—	8
Strawberry Poison Arrow Frog	<i>Dendrobates pumilio</i>	38	—	—	—	28	—	10
TOTAL Amphibians: 23		57	—	—	—	34	—	23
INVERTEBRATES								
Leaf Cutting Ant	<i>Atta cephalotes</i>	Colony	—	↑↑	—	↓	—	Colony ↑
Reddish Buff Moth	<i>Acosmetia caliginosa hubner</i>	*3 Colony	—	↑	—	—	Larvae	Colony
Julia, Common Mormon, Postman and Zebra Butterflies ■	<i>Dryas julia</i> , <i>Papilio ploytes</i> , <i>Heliconius melphomene</i> and <i>Heliconius charitonia</i>	—	Pupae	↑	—	↓	—	0
Maclay's Spectre	<i>Extatosoma tiaratum</i>	Colony	—	—	—	↓	—	Colony ↓
Annam Stick Insect	<i>Baculum spp.</i>	Colony	—	—	—	↓↓	—	0
Pink Winged Stick Insect	<i>Sipyloidea sipylos</i>	Colony	—	↑↑	—	—	—	Colony ↑
Titan Stick Insect	<i>Acrophylla wuelfingi</i>	Colony	—	—	—	↓↓	—	0
Praying Mantis	<i>Sphrodromantis viridis</i>	2	—	—	—	1	—	1
Giant Cockroach	<i>Gromphadorina portentosa</i>	Colony	—	↑↑	—	↓	—	Colony ↑
Dung Beetle	<i>Scarabaeidae spp.</i>	2	—	—	—	2	—	0
Fruit Beetle	<i>Pachnoda spp.</i>	—	10	—	—	—	—	10
Imperial Scorpion	<i>Pandinus imperator</i>	6	5	—	—	6	—	5
Indian Ornamental Spider	<i>Poecilothreia regalis</i>	3	—	—	—	2	—	1
Goliath Bird Eating Spider	<i>Theraphosa leblondi</i>	1	—	2	—	—	—	3
Chocolate Millipede	<i>Diploda spp.</i>	4	—	—	—	4	—	0
Giant Millipede	<i>Diploda spp.</i>	2	10	—	—	2	—	10
Train Millipede	<i>Diploda spp.</i>	4	—	—	—	4	—	0
TOTAL Invertebrates: 30		24	25	2	—	21	—	30
FISH								
Pacu	<i>Colossoma brachypomum</i>	3	—	—	—	—	—	3
Plecostomus	<i>Plecostomus spp.</i>	1	—	—	—	—	—	1
Pink Tailed Shark	<i>Leptobarbus hoeveni</i>	2	—	—	—	—	—	2
Tin Foil Barb	<i>Barbus schwanenfeldii</i>	4	—	—	—	—	—	4
TOTAL Fish: 10		10	—	—	—	—	—	10

The following species are also jointly owned, but are not currently represented at Marwell:

Blackbuck (*Antelope cervicapra*)
Gaur (*Bos gaurus*)
Nilgai (*Boselaphus tragocamelus*)
Pere David's Deer (*Elaphurus davidianus*)
Persian Onager (*Equus hemionus onager*)

↑ Increase
↓ Decrease
↑↑ Substantial Increase
↓↓ Substantial Decrease

*1 One born late 1996 and not reported until early 1997

*2 One placed in Marwell's quarantine by MAFF following confiscation of this animal after illegal shipment by a member of the public – animal donated to Marwell during 1997

*3 Precise numbers not feasible

† Species jointly owned by Marwell Preservation Trust and the Zoological Society of London

‡ Free flying – numbers vary

■ Seasonal breeding affects stock count numbers

THE MARWELL PRESERVATION TRUST LIMITED

(a company limited by guarantee)

Registered No. 1355272

GROUP FINANCIAL STATEMENTS for the year ended 31 December 1997

TRUSTEES' REPORT

The Trustees, who are the company's directors, present their Annual Report together with the audited financial statements for the year ended 31 December 1997.

Principal activities and business review

The principal activity of the Trust is the operation of Marwell Zoological Park with its scientific and educational programmes. A review of the year is given on pages 1 to 19 of the report.

Operating results

The surplus for the year, including donations, was £408,022 (1996: £660,725, including £393,855 from the Marwell Zoological Society in respect of the donation of Penguin World). The surplus for the year has been transferred to the General Fund.

Scientific research

The Trust is actively involved in the support of animal breeding and conservation programmes in the United Kingdom and overseas.

Trustees and Trustees' interests

The Trustees who held office during the year are listed facing page 1.

The Trustees hold no beneficial interest in the Trust. The Trustees have each guaranteed the sum of £1.

Conservation expenditure

The Trust has made contributions amounting to £71,965 during the year (1996: £36,640) to conservation projects. In addition to direct financial support, the Trust supports projects by providing the Trust's staff for the training and education of conservation project teams. Support provided has included the Chipangali-Marwell Duiker Project in Bulawayo, the Madagascar Fauna Group and the EPULU Okapi Project.

Corporate governance

The Trust is a registered charity and a company limited by guarantee. Its governing instrument is the Memorandum and Articles of Association.

The Trustees Board is the governing body and consists of a maximum of eighteen members, which meet every six months. The Board considers matters reserved to itself for decision and also receives reports on other matters.

Governance matters not reserved for the Board are delegated to one of two Committees. The Committees are:

Executive Committee

The Committee comprises four members, who are all Trustees, and meets as required and oversees the day to day running of the Trust.

Audit and Remuneration Committee

The Committee consists of four members, who are all Trustees. Meetings are attended by the Director and representatives of the external auditors. The principal matters to be dealt with by the Committee are:

- to determine and recommend to the Board the remuneration of the Director and to approve the remuneration of senior executives;
- to assess the operational and financial risks and the control environment established to address those risks. This includes a review of the annual accounts and consideration of any significant issues arising in respect of either internal or external audit.

Trustees do not receive remuneration. Where claimed, expenses are reimbursed.

Reserves policy

The Trust has developed a reserves policy, the objective of which is to ensure the continued operation of the Zoological Park, including its scientific, educational and conservation programmes.

Accordingly, it is the Trust's policy to hold a base reserve over and above that held in fixed assets, which at all times is equivalent to at least three months operating expenditure.

Trustees' responsibilities

Company law requires the Trustees to prepare financial statements for each financial period which give a true and fair view of the state of affairs of the Trust and the Group and of the net incoming or outgoing resources for that period. In preparing those financial statements, the Trustees are required to:

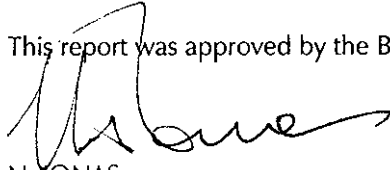
- select suitable accounting policies and then apply them consistently;
- make judgements and estimates that are reasonable and prudent;
- prepare the financial statements on the going concern basis, unless it is inappropriate to presume that the Trust will continue in business.

The Trustees are responsible for keeping proper accounting records which disclose with reasonable accuracy at any time the financial position of the Trust and to enable them to ensure that the financial statements comply with the Companies Act 1985. They have general responsibility for taking such steps as are reasonably open to them to safeguard the assets of the Group and to prevent and detect fraud and other irregularities.

Auditors

In accordance with Section 384 of the Companies Act 1985, a resolution for the re-appointment of KPMG as auditors of the Trust will be proposed at the forthcoming Annual General Meeting.

This report was approved by the Board of Trustees on 22 April 1998.



N. JONAS
Chairman, Board of Trustees

MARWELL ZOOLOGICAL PARK
Colden Common, Winchester, Hampshire

REPORT OF THE AUDITORS, KPMG, TO THE MEMBERS OF THE MARWELL PRESERVATION TRUST LIMITED

We have audited the financial statements on pages 22 to 28.

Respective responsibilities of Trustees and Auditors

As described above, the Trustees 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.

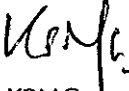
Basis of opinion

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 the Trustees in the preparation of the financial statements, and of whether the accounting policies are appropriate to the Group'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 Trust and the Group as at 31 December 1997 and of the net incoming resources of the Group for the year then ended and have been properly prepared in accordance with the Companies Act 1985.



KPMG
Chartered Accountants
Registered Auditors
Southampton

22 April 1998

GROUP STATEMENT OF FINANCIAL ACTIVITIES
(incorporating the group income and expenditure account)
for the year ended 31 December 1997

	Note	1997	1996
		£	£
Incoming resources			
Admissions and special events	4	1,941,520	1,654,471
Retail services	5	345,562	308,599
Other income		94,052	61,039
Animal adoption scheme	2	72,910	67,550
Donations and legacies	8	71,607	18,241
Interest receivable		74,375	68,637
Incoming resources from operations		2,600,026	2,178,537
Gift of Penguin World		—	393,855
Total income resources		2,600,026	2,572,392
Resources expended			
<i>Direct charitable expenditure</i>			
Food and animal care		219,812	215,156
Park utilities, maintenance and depreciation		486,365	426,096
Salaries and wages	7	583,499	520,766
Advertising and publications		345,721	268,401
Support costs		78,965	73,917
Conservation expenditure		71,965	36,640
		1,786,327	1,540,976
<i>Other expenditure</i>			
Fund raising and publicity		19,232	9,417
Salaries and wages	7	242,671	226,142
Administration costs		143,774	135,132
		405,677	370,691
Total resources expended		(2,192,004)	(1,911,667)
Net incoming resources from operations		408,022	266,870
Gift of Penguin World		—	393,855
Net incoming resources		408,022	660,725
General fund at 1 January 1997		3,893,385	3,232,660
General fund at 31 December 1997		4,301,407	3,893,385

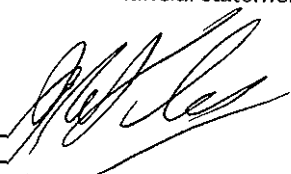
In both the current and previous years, the Trust made no acquisitions and had no discontinued operations. There are no recognised gains and losses other than the surplus for the year as reported above. A statement of movement on reserves is given in note 15.

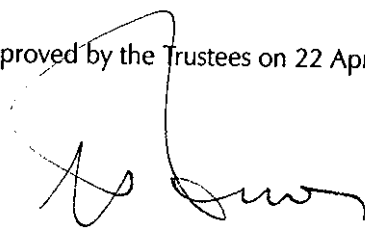
These financial statements have adopted the provisions of the SORP - Accounting by Charities and, in so far as practicably possible, have differentiated between direct charitable and other expenditure.

GROUP AND COMPANY BALANCE SHEETS
at 31 December 1997

	Note	1997 £	Group 1996 £	1997 £	Trust 1996 £
Fixed assets					
Tangible assets	9	3,292,350	2,936,658	3,292,350	2,936,658
Animal collection	2	1	1	1	1
Investments	10	—	—	100	100
		<u>3,292,351</u>	<u>2,936,659</u>	<u>3,292,451</u>	<u>2,936,759</u>
Current assets					
Stocks	11	124,507	109,916	42,854	57,462
Debtors	12	88,789	68,943	142,747	112,004
Cash at bank and in hand		1,249,599	1,209,721	1,249,590	1,195,312
		<u>1,462,895</u>	<u>1,388,580</u>	<u>1,435,191</u>	<u>1,364,778</u>
Creditors: amounts falling due within one year	13	(205,822)	(199,365)	(178,218)	(175,663)
Net current assets		<u>1,257,073</u>	<u>1,189,215</u>	<u>1,256,973</u>	<u>1,189,115</u>
Total assets less current liabilities		<u>4,549,424</u>	<u>4,125,874</u>	<u>4,549,424</u>	<u>4,125,874</u>
Deferred income	14	(248,017)	(232,489)	(248,017)	(232,489)
Net assets		<u>4,301,407</u>	<u>3,893,385</u>	<u>4,301,407</u>	<u>3,893,385</u>
Reserves					
General fund	15	<u>4,301,407</u>	<u>3,893,385</u>	<u>4,301,407</u>	<u>3,893,385</u>

These financial statements were approved by the Trustees on 22 April 1998 and were signed on their behalf by:


J.M. KNOWLES
Trustee


N. JONAS
Trustee

GROUP CASH FLOW STATEMENT
for the year ended 31 December 1997

Cash flow statement	Note	1997 £	1996 £
Net cash inflow from operating activities	I	447,376	315,382
Returns on investments and servicing of finance	II	73,906	58,126
Capital expenditure and financial investment	III	(481,404)	(276,513)
Increase in cash		39,878	96,995
Reconciliation of net cash inflow to movements in net funds		1997 £	1996 £
Increase in cash in year and change in net funds		39,878	96,995
Net funds at the beginning of the year		1,209,721	1,112,726
Net funds at the end of the year		1,249,599	1,209,721
I Reconciliation of net incoming resources to net cash inflow from operating activities		1997 £	1996 £
Net incoming resources		408,022	660,725
Depreciation		127,415	112,720
(Increase)/decrease in stocks		(14,591)	230
(Increase)/decrease in debtors		(19,377)	2,009
Increase/(decrease) in creditors		27,180	(17,232)
Amortisation of capital grants		(5,195)	(5,195)
Profit on sale of tangible fixed assets		(1,703)	—
Interest receivable		(74,375)	(68,637)
Donation of Penguin World		—	(369,238)
Net cash inflow from operating activities		447,376	315,382
II Returns on investments and servicing finance		1997 £	1996 £
Interest received		73,906	58,126
III Capital expenditure and financial investment		1997 £	1996 £
Purchase of tangible fixed assets		(483,107)	(276,513)
Receipts from sales of tangible fixed assets		1,703	—
Net cash outflow		(481,404)	(276,513)
IV Analysis of changes in net funds	1 January 1997 £	Cash flow £	31 December 1997 £
Cash at bank and in hand	1,209,721	39,878	1,249,599

NOTES

(forming part of the financial statements)

1. Trust status

The Marwell Preservation Trust Limited (the Trust) is a company limited by guarantee (number 1355272) and registered with the Charity Commission (number 275433).

The Trustees are advised that the Trust has no tax liability for the period covered by these financial statements.

The members of the Trust have guaranteed the liabilities of the Trust to the extent of £1 each.

2. Accounting policies

The following accounting policies have been applied consistently in dealing with items which are considered material in relation to the Group's financial statements.

(a) *Basis of preparation*

The financial statements have been prepared under the historical cost convention. The accounts incorporate the recommendations of the Statement of Recommended Practice: Accounting by Charities. The classification of expenditure between direct charitable and other expenditure has been adopted to the extent that the expenditure of the Trust can be so categorised.

Changes in the presentation of the consolidated cash flow statement have been made consequent upon the adoption of the revised Financial Reporting Standard No. 1 'Cash Flow Statements'. Comparative figures have been restated in accordance with the revised presentation.

(b) *Basis of consolidation*

The consolidated financial statements incorporate the financial statements of the Trust and its subsidiary undertaking, Marwell Services Limited.

(c) *Property*

Property is shown at the cost incurred since the creation of the Park in 1970. Some of the costs relate to periods prior to the formation of The Marwell Preservation Trust Limited.

(d) *Depreciation*

No depreciation is provided on freehold land and permanent buildings where the remaining expected life exceeds fifty years. It is the Group's policy to maintain these buildings in a continual state of sound repair and to make improvements thereto from time to time and, accordingly, the Trustees consider that the lives of these assets are so long and residual values, based on prices prevailing at the time of acquisition, are so high that the depreciation is insignificant.

Other depreciation is calculated as follows:

Animal houses and temporary buildings	– 2% p.a. straight line
Fencing	– 7½% p.a. straight line
Plant and equipment	– 25% p.a. straight line
Railway	– 8½% p.a. straight line
Gift shop	– 4% p.a. straight line

(e) *Grants*

Capital grants received for animal housing are treated as deferred income, from which annual instalments over a period of fifty years are taken to the credit of the Income and Expenditure account. Revenue grants are credited to the Income and Expenditure account against the costs to which they relate.

(f) *Animals*

The animal collection is shown at a nominal value of £1. The Trustees consider an annual valuation of the collection to be inappropriate. Proceeds of sales of animals are credited and the costs of additions to the collection by purchase or breeding are written off to the Income and Expenditure account.

(g) *Stocks*

Stocks are valued at the lower of cost and net realisable value.

(h) *Covenants*

The covenant from Marwell Services Limited is detailed in note 5. Tax recoverable on other covenants is credited when received. The tax recovered for the year ended 5 April 1997 was £5,837 (1996: £7,229) on covenants relating to the Animal Adoption Scheme and sundry donations.

(i) *Donations, covenants and legacies*

Donations, covenants and legacies are recognised in the Income and Expenditure account. The donation of capital projects is included in the financial statements when the asset has been formally handed over to the Trust by the donor.

(j) *Pension costs*

The Trust operates a defined contribution pension scheme for certain employees. The scheme funds are administered by managers independent of the Group's finances. The pension charge represents contributions payable by the Group to the fund (see note 7).

(k) *Hire purchase contracts*

Fixed assets acquired under hire purchase contracts are capitalised. Interest charges are calculated as a proportion of annual instalments paid based on the sum of digits method.

3. Group income and expenditure account

The surplus of income over expenditure is stated after the following:

	1997 £	1996 £
<i>Charging</i>		
Director's emoluments	34,666	34,713
Payments into defined contribution pension schemes	20,663	23,075
	<u>55,329</u>	<u>57,788</u>
Auditors' remuneration from the Group – audit services	7,399	7,180
– non-audit services	20,035	24,409
	15,700	15,476
Equipment hire	127,415	112,720
Depreciation		
<i>Crediting</i>		
Profit on sale of fixed assets	1,703	–
Grants (note 6)	53,018	61,749
	<u>53,018</u>	<u>61,749</u>

Other than the zoo director, no Trustee received any emoluments from the Group. The audit fee for the Trust, which is included above, was £6,129 (1996: £5,950). The creditor at the year end relating to pension contributions was £nil (1996: £nil).

4. Turnover

Turnover represents the total amount receivable for sales and services, excluding value added tax.

5. Retail services

The Group's income from retail services comprises:

	1997 £	1996 £
Guide books	45,942	48,063
Train rides	60,070	52,295
Management charges from subsidiary company	49,022	40,118
Catering commission	77,882	70,380
Concession fees	64,769	50,155
Covenanted profits (gross) from subsidiary company (see below)	47,877	47,588
	<u>345,562</u>	<u>308,599</u>

Income derived from the shops and other taxable income is receivable by Marwell Services Limited, as the receipt of this trading income by the Trust would have been taxable. Marwell Services Limited has covenanted all of its profits to the Trust.

The profit and loss account for Marwell Services Limited is summarised below:

	1997 £	1996 £
Turnover	544,685	435,645
Cost of sales	(252,804)	(189,656)
	<u>291,881</u>	<u>245,989</u>
Gross profit	(244,004)	(198,401)
Administration expenses		
	47,877	47,588
Profit on ordinary activities before and after taxation	(47,877)	(47,588)
Transferred to the Trust by Deed of Covenant		
	<u>–</u>	<u>–</u>
Retained result for the financial year		

6. Revenue grants

Education and repair grants received during the year have been deducted from the costs incurred as follows:

	1997 £	1996 £
Repairs	300	7,149
Administration salaries	52,718	54,600
	<u>53,018</u>	<u>61,749</u>

7. Staff numbers and costs

The average number of persons employed by the Group and the Trust during the year, analysed by category, was as follows:

	Group		Trust	
	1997 No.	1996 No.	1997 No.	1996 No.
<i>Number of employees</i>				
Management	6	6	2	2
Administration	20	18	20	18
Operating	68	62	57	53
	<u>94</u>	<u>86</u>	<u>79</u>	<u>73</u>

The aggregate payroll costs of these persons were as follows:

	Group		Trust	
	1997 £	1996 £	1997 £	1996 £
Wages and salaries	855,584	771,332	787,608	716,113
Social security costs	65,090	57,992	61,230	54,823
Other pension costs	35,204	34,845	33,260	32,954
	<u>955,878</u>	<u>864,169</u>	<u>882,098</u>	<u>803,890</u>

Administrative salary costs of £52,718 (1996: £54,600) are deducted from revenue grants (see note 6). Payroll costs of £6,084 (1996: £2,382) have been capitalised.

8. Donations, covenants and legacies

	1997 £	1996 £
Donations, covenants and legacies	92,330	18,241
Less deferred Education Centre donations	(20,723)	-
	<u>71,607</u>	<u>18,241</u>

9. Tangible fixed assets

	Freehold land and buildings £	Animal houses, temporary buildings and fences £	Plant and equipment £	Railway £	Gift shop £	Assets in the course of construction £	Total £
Group and Trust							
<i>Cost or value of gifts</i>							
At 1 January 1997	599,867	2,736,136	443,632	140,074	-	-	3,919,709
Additions	-	48,073	21,617	1,008	395,796	16,613	483,107
At 31 December 1997	<u>599,867</u>	<u>2,784,209</u>	<u>465,249</u>	<u>141,082</u>	<u>395,796</u>	<u>16,613</u>	<u>4,402,816</u>
<i>Depreciation</i>							
At 1 January 1997	-	519,821	365,216	98,014	-	-	983,051
Charged in year	-	75,450	30,701	11,956	9,308	-	127,415
At 31 December 1997	<u>-</u>	<u>595,271</u>	<u>395,917</u>	<u>109,970</u>	<u>9,308</u>	<u>-</u>	<u>1,110,466</u>
<i>Net book value</i>							
At 31 December 1997	<u>599,867</u>	<u>2,188,938</u>	<u>69,332</u>	<u>31,112</u>	<u>386,488</u>	<u>16,613</u>	<u>3,292,350</u>
At 31 December 1996	<u>599,867</u>	<u>2,216,315</u>	<u>78,416</u>	<u>42,060</u>	<u>-</u>	<u>-</u>	<u>2,936,658</u>

10. Investments (held as fixed assets)

The Trust owns the whole of the issued share capital of Marwell Services Limited, a company incorporated in England which carries on the business of retail shops. The investment, which consists of 100 ordinary shares of £1 each, is shown at cost. In the opinion of the Trustees, the aggregate value of the shares in and amounts owing from the Trust's subsidiary is not less than the aggregate of the amounts at which those assets are stated in the Trust's balance sheet. At 31 December 1997 the aggregate of the subsidiary's capital and reserves amounted to £100 (1996: £100) and retained results for the year then ended were £nil (1996: £nil). Amounts owed by the subsidiary to the Trust are disclosed in note 12.

11. Stocks	Group		Trust	
	1997 £	1996 £	1997 £	1996 £
Raw materials and consumables	12,680	11,794	12,680	11,794
Goods for resale	111,827	98,122	30,174	45,668
	<u>124,507</u>	<u>109,916</u>	<u>42,854</u>	<u>57,462</u>

12. Debtors	Group		Trust	
	1997 £	1996 £	1997 £	1996 £
Trade debtors	24,734	6,549	24,734	6,549
Amounts owed by subsidiary undertaking	—	—	53,958	43,061
Other debtors	11,012	12,128	11,012	12,128
Prepayments and accrued income	53,043	50,266	53,043	50,266
	<u>88,789</u>	<u>68,943</u>	<u>142,747</u>	<u>112,004</u>

13. Creditors: amounts falling due within one year	Group		Trust	
	1997 £	1996 £	1997 £	1996 £
Trade creditors	83,166	115,711	76,817	113,039
Other taxes	53,914	50,576	35,179	31,776
Social security	10,777	8,964	10,777	8,964
Accruals	57,965	24,114	55,445	21,884
	<u>205,822</u>	<u>199,365</u>	<u>178,218</u>	<u>175,663</u>

14. Deferred income	Animal housing grant £	Encounter area grant £	Education centre £	Total £
Group and Trust				
At 1 January 1997	24,594	207,895	—	232,489
Transferred (to)/from income and expenditure account	(637)	(4,558)	20,723	15,528
At 31 December 1997	<u>23,957</u>	<u>203,337</u>	<u>20,723</u>	<u>248,017</u>

The Encounter Area grant, received from Hampshire County Council, was to assist with the development of the children's encounter area within the zoological park.

15. Statement of movement on reserves

	General fund £
Group and Trust	
At 1 January 1997	3,893,385
Net incoming resources	408,022
At 31 December 1997	<u>4,301,407</u>

The Trust's surplus of income over expenditure for the year was £408,022 (1996: £660,725). In accordance with the exemptions allowed by Section 230 of the Companies Act 1985, the Trust has not presented its own profit and loss account.

16. Commitments

Capital commitments at the end of the financial year for which no provision has been made in the financial statements:

	1997 £	1996 £
Group and Trust		
Contracted	—	315,000

STAFF as at 31 December 1997

ADMINISTRATION

Director
J.M. Knowles, OBE
General Manager
P.J. Hickman
Assistant to the Director
Miss L.J. Stafford
Assistant General Manager
R.E. Chambers
Financial Controller
Miss J. Carpenter
Group Sales and Events Co-ordinators
Mrs. L. Johnson · Ms. D. Preston
Reception and Party Bookings
Mrs. J. Hills · Mrs. D. Pearson · Mrs. L. Simpson
Press and Public Relations Officer
Mrs. G. Worman
Adoptions Secretary
Miss M. Walton

EDUCATION SERVICE

Head of Education and Graphics
Mrs. S. Millar, BSc
Assistant Head of Education
Miss A. Middleton, BSc(Hons), CertEd
Senior Education Officer
Miss C. Sulston, BSc
Education Officers
Miss P. Harwood, BSc(Hons)
Mrs. J. Gore, BSc(Hons) [from January 1997]
Miss K. Bailey, BSc(Hons) [from June 1997]
Administrative Assistant
Miss D. Foster

MEMBERSHIP

Mrs. G. Banfield · Mrs. S. Smith

GATE STAFF

A Burchett · R. Lillywhite · J. Ashton · F. Thomas

GROUND STAFF

B. Kerswell · A. Maddocks · I. Frost · R. Organ
A. Madgewick · J. Hughes · P. Henty · P. Bloxham

SUPPORT SERVICES MANAGER

P. Crump

BUILDING MAINTENANCE

J. Dine · B. Dominey · B. Powell · J. Lloyd

TRAIN DRIVERS

B. Masters · G. Cook · R. Chappel

ANIMAL COLLECTION

Curator
P. Bircher
Deputy Curator
P. Small
Assistant Curator
G. Campbell
Data and Records Keeper
Mrs. N. Leedell
Biologist
S. Wakefield, MSc
Carnivore Section
P. Hindmarsh (Head Keeper)
S. Younger (Assistant Head Keeper)
East Section
S. Belcher (Head Keeper)
S. Holdsworth (Assistant Head Keeper)
Miss C. Edwards · D. Baldwin · Miss S. Dobell
North Section
S. Hawker (Head Keeper)
Miss A. Last (Assistant Head Keeper)
S. Large · C. Brown · Miss A. Stickler · Miss S. Wiemers
South Section
G. Read (Head Keeper)
Mrs. S. Boxall (Assistant Head Keeper)
P. Robbins (Acting Assistant Head Keeper)
P. Irven · P. Elson · Miss R. Avery
West Section
B. Hall (Head Keeper)
I. Goodwin (Assistant Head Keeper)
A. Platt · K. Saunders
Encounter Village
D. Schofield (Head Keeper)
Miss H. Pritchard · Miss J. Andrews
Animal Maintenance
R. Coward · S. Bennett

PROMOTION DISTRIBUTION

M. Newell

RETAIL MANAGERESS

Mrs. E. Conduct

CONSERVATION RESEARCH ASSISTANT

T. Woodfine

RESEARCH ASSISTANT

Miss N. Roddis

Front Cover Photograph:

Head Keeper, Simon Hawker, with Elila, the baby Okapi
Gaynor Worman

Back Cover Photograph:

Simon Brooke-Webb, Solent News Agency

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