IZN

INTERNATIONAL ZOO NEWS

A magazine providing an intelligence service of news from and about zoos of the world.

Published by ZOO-CENTRUM, London, England.
Proprietor: JOHN ASPINALL
Editor: PETER BUNYARD, WORTHYVALE MANOR FARM, CAMELFORD, CORNWALL, UK.
Advisory Editor: GEOFFREY SCHOMBERG.

Annual Subscriptions
Surface mail: £15.00, US$40.00, DM62.50
Airmail: £19.00, US$50.00
Subscriptions should be prepaid and will continue automatically from year to year until cancelled by the subscriber. Please make cheques payable to Zoo-Centrum, and send to:
IZN Subscription Dept., Worthyvale Manor Farm,
Camelford, Cornwall, PL32 9TT, England.
Zoo-Centrum's bankers: National Westminster Bank Ltd., 26 Molesworth Street, Wadebridge, Cornwall, England.

Advertisements
Details may be found elsewhere in this issue. The editor is not responsible for the accuracy of any advertisements in this magazine.

Contributions
The editor welcomes contributions, which should be typed, double spaced, on one side of the paper only, and with generous margins. Contributions should be accompanied by black and white photographs, line drawings, and tables where appropriate. For feature articles, the editor should be queried in advance in case a similar article has already been accepted.

IZN's International Serial Number is NE ISSN 0020-9155.
International Zoo News is copyright throughout the world and no article may be reproduced in whole or in part without the written permission of the editor. ©1980 Zoo-Centrum.

Printed by Penwell Ltd., Parkwood, Callington, Cornwall, England.

Contents

International Zoo News No. 181, Vol. 30/5 **September/October 1983**

EDITORIAL 2

FEATURE ARTICLES

The Galapagos Penguin at the Bermuda Government Aquarium 6
L. S. Mowbray

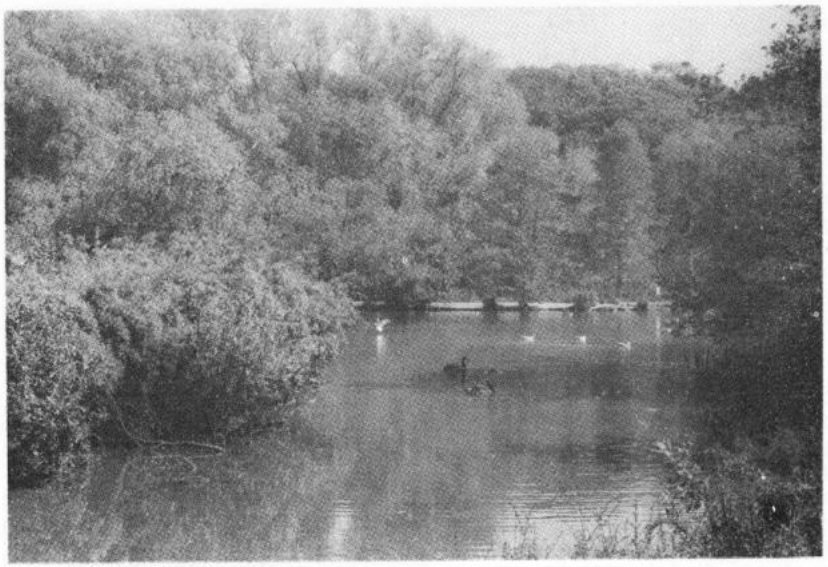
Egg-laying and incubation in the Emu 10
Ing. Struzka Milos

Breeding the noisy Pitta 17
Ron Parrish

Advances in hand-rearing Techniques for thick-billed Parrot at the Jersey Wildlife Preservation Trust 20
Peter B. Pugh

Annual Reports 28
Conservation 42
International Zoo News 46

W.E Francis



Part of lake, Paignton Zoo

Maintenance Department

Lion Paddock: The outside bench on which the pair of lions rested was completely ruined by them. They formed the habit of gnawing and scratching the edge of the very thick wooden platform until it collapsed under this continual treatment. To combat this, a 2″ x 2″ x ⅜″ Angle Iron frame was made and carpenters fitted 6″ x 2″ planks tight to the frame—the animals can no longer chew the edges and it is hoped their resting table will last longer.

Chimpanzee Cage: The two male chimpanzees have become very strong over the years and love to swing, hanging from the bars of the roof of their cage. On inspection it was necessary to take away the roof of the outside cage and replace it with stronger material.

Eland Paddock, Pets Corner & Zebra Paddock: Over 300 feet of extra strong 3.55 gauge by 50 mm chain link fencing replaced the old fencing along the front of the Eland or East Paddock, and in the 'catch-up' area metal gates were altered to allow the keeper to open and close the gates without having to go in with the animals.

At Pets Corner it was necessary to remove all the old posts and fencing and renew with over 200 feet of the heavier gauge fencing—some 22 new angle iron posts were used.

Nearly 400 feet of 50 mm heavy gauge fencing replaced the fencing alongside the Main Drive at the East Nursery Paddock, inhabited at present by zebra.

In all these cases, the heavier fencing of 6′ high was used; all the uprights and gates were repainted making this area much improved.

Chinese Water Deer: The fence surrounding the Marsh has been replaced by new 6″ x 2″ chain link fencing. Some 46 new 2″ x 2″ Angle Iron posts 7′6″ long were concreted into the ground, and 2 new service gates were made and fixed by our own fitter.

Tropical House: A new large and well lit propagating house has been constructed in place of the old potting shed. This was done by removing the dilapidated back and side of the House adjoining the Pay Box of the Tropical House. It was necessary to remove some of the low wall to allow more light into the house. All 8 frames were rotten and were replaced; the end wall was rebuilt and a new door fitted for access to Crane Row and a further two new doors to allow access to the back yards at The Square. In all 240 panes of 24oz x 20″ x 14″ horticultural glass were fitted.

2nd Parrot Flight: The second Parrot Flight has been completed with high sleeping quarters some 8′ into the roof of each aviary. The Flight is constructed with 1″ galvanised tube and 'K' clamp fittings. Its dimensions are 32′ x 24′ with a central dividing portion to give two large separate aviaries. The tube is covered with 16 gauge x 1″ chain link fencing. Each aviary has its own foliage and bushes growing inside. At the back a 8′ x 6′ vestibule is constructed in each one to allow keepers to go inside without the birds escaping. Sleeping quarters built in the roof of the aviaries are fitted with breeding boxes and are insulated all over with fibre glass, easy shutters and small windows in them allow the keepers to see and tend the birds if they are inside. These aviaries are some of the most efficient, spacious and modern ever built in the Zoo; a further block is in the throes of construction and should be ready by summer 1983.

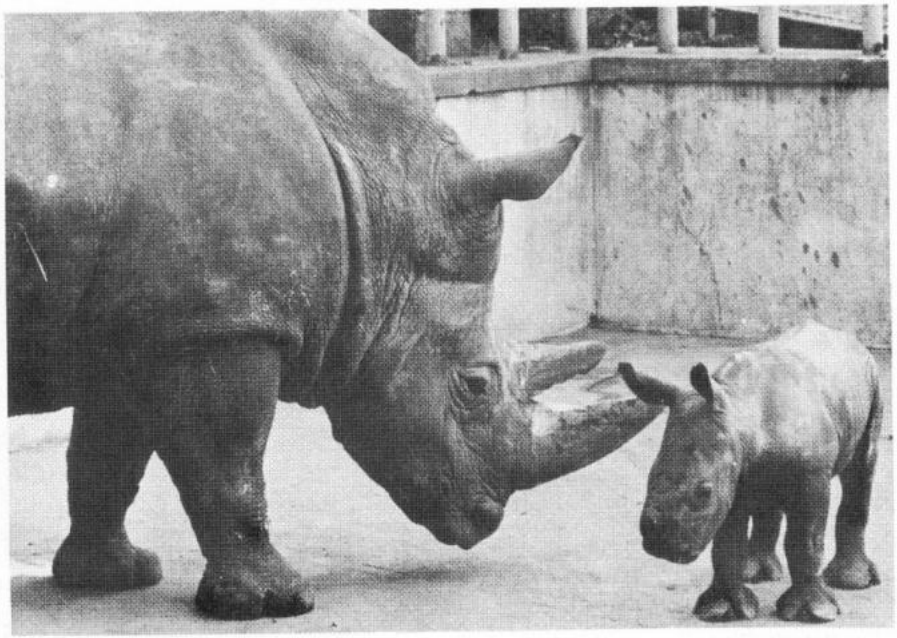
Parrot House: This house, over the years, has deteriorated so much that last year it became unsafe for use. Our own carpenters have spent several months working on it and already have replaced two large sections of the roof, each measuring 32′ x 22′, replacing all principal rafters, purlins and plates, and renewing and enlarging the glass lights by fitting Filon sections, giving much more light than the old glass frames. The old rows of small cages inside this section have been removed; a new concrete floor has been laid complete with an efficient drainage system. A 26′ x 6′ dividing wall has been built with new doors to form a new locker room for all the staff of the Bird Section, and on the other side a new, very light and hygienic Cutting Up Room for the Bird Section. Work Benches with formica tops, wooden shelves and cupboards and a sink have all been fitted. Heating pipes to give adequate warmth in the winter run the whole length of the building; modern strip lighting is also in existence, and a small gas cooker is installed, and so too is a small refrigerated cold cupboard. The old passage way allows access to both back and front of the building and makes easier working facilities for all concerned.

Aquarium. At the last Health & Safety Inspection, the large concrete platform holding many of the heavy fish tanks gave the Inspector some concern. During the year our busy mason with the help of our aquarium staff removed the tanks and then built 7 x 4′6″ high x 18″ x 9″ piers in concrete blocks, rendered them with cement and sand and fitted a locking plate some 32′ x 2′ made of 2¼″ flat steel to allow the fish tanks to rest on it. A much needed new drainage system was also completed.

The Zoological Society of Scotland, Edinburgh Zoo, 1982

The Collection

Primates. The chimpanzees continued to use their new playground in an extremely satisfactory way and there is no doubt that the improvements have contributed to their welfare. A problem which had to be faced early in the year was the inability of Annie, the young female, to get on with our much older female Polly. After the failure of all efforts to introduce Annie into the whole group, it was decided to move Polly to another collection rather than deny Annie's breeding potential. Polly is now in a collection in the South where she joined two males and this seems to have worked out extremely well. One of our older males, Walter, became very sick during the year and subsequently died. We were requested at fairly short notice to provide accommodation, at least on a temporary basis, for two young male chimpanzees, who had previously been in a laboratory. King Louis is a wild-caught animal, and Digby was born at Chester Zoo. Initially they both settled down well in the group, although Digby always appeared more apprehensive than King Louis. Later he became positively afraid of the other animals and it was necessary to take him out of the group at the year's end, with a view to his being sent to another collection. King Louis integrated extremely well and indeed was seen to mate with Cindy. In view of the fact that there had been no



White rhino mother and calf—September 1982

successful breeding since Walter was removed from the group, it was decided that Louis should remain, at least until his breeding ability was proven.

The orang utans continued to stay successfully in their new quarters, although there was a period when it looked as if they might start to dig themselves out of their compound. Although Jantan and Maria were inseparable and although mating was observed on a number of occasions, Maria did not become pregnant and this caused some concern. Urine samples were collected and sent to Dr. Alan Dixon of the Wellcome Institute, Zoological Society of London, for analysis. Results showed that Maria was in fact not ovulating.

Our gibbon collection was most unsatisfactory as our twenty year old female died during the winter leaving us just three males. A female was located in Chester Zoo, but unfortunately, an accident occurred to this animal before she could be moved to Edinburgh. Efforts were still continuing at the end of the year to locate another female for our group.

There was great news of our ring-tailed lemurs. After many years of switching animals around to find a compatible pair, this was at last achieved and twins were born. Unfortunately, one of these died, but the other, a male, was reared by the mother very satisfactorily and at the end of the year was making excellent progress.

The year started with a request from the International Primate Protection League and the St. Andrews Animal Fund for us to find accommodation possibly of a temporary nature, for a group of sixteen stump-tailed macaques from Stirling University. The alternative was for the animals to be put down. The emergency was met by providing room within the Children's Play Cage, which of course was not required during the winter, and they were later moved into the completed Gorilla Exhibit area. The animals from Stirling were joined by two that had been released on an island in the Firth of Forth, where the local authority had demanded they be recaptured. There were various difficulties as might be expected with a group from a laboratory, but once the new medium sized monkey house is completed the

animals from Stirling and from our own group will be mixed in the hope they will form a viable breeding group.

It was decided to reassess the situation regarding the Diana monkeys, with a view to using their potential in a more efficient way, and as a result, the female Ethel was re-introduced into the group and the female Natalie was sent to Belfast Zoo on breeding loan. The non-breeding female Jane was removed from the group and placed with a male sent to us on breeding loan in 1981.

The barbary macaques continued to prosper on the Baboon Rock. Following the previous year's failure to rear young, it is good to report that a female born during the year was growing up fast.

In the squirrel monkey group two young were born, but both unfortunately died. A female was born in our stump-tailed macaque group, but there were no other primate births.

The Society was asked if it could help over an emergency seizure of animals. A consignment of birds from South America to Belgium was carefully examined at Gatwick and the crate was found to have a false bottom, in which were concealed a pair of pygmy marmosets, four black-mantled tamarins and three acouchis. The Society's quarantine area proved to be ideal for these animals, and with the splendid support of the Department of Agriculture, the airlines and the Customs and Excise Department, these animals were moved quickly to Edinburgh and taken into our care. It is good to report that although all these animals were in poor condition, only one, a black-mantled tamarin, died. The acouchis were placed in the Monkey House with the common marmosets, forming an interesting mixed group, and have settled down extremely well. The Zoological Society of London also have acouchis, and it is hoped that jointly it may be possible to maintain and breed these animals in captivity. The pygmy marmosets and the black-mantled tamarins remained in the Quarantine area and will continue to stay there until such time as accommodation is built for them.

Carnivores. Two female otters came to us during the year, one from the Highland Wildlife Park and one from the Sea-life Centre, Oban. The latter animal had been handed in following an accident, presumably with a vehicle; she was however nursed back to good health and both the animals were in the otter enclosure at the year's end. They are both extremely shy and have not been observed by many visitors. Members of staff have seen them however in the evenings when the Park is quiet. A male otter had been promised to the Society, but subsequently was sent to the Otter Trust, and we were still looking for a male at the end of the year.

The wild cats produced two litters of kittens during the year; two born in April were found dead, but three born later in the year were extremely healthy. The leopard cats also had a kitten, but unfortunately it did not survive.

It was decided to send the adult pair of leopards to a zoo in Jordan, and to keep a young male who had been hand-reared.

There was no breeding of lions during the year and one of the cubs born in 1981 had to be put down because of bone dystrophy. The female tiger, Cora, was given a hormone implant to prevent further breeding, and one of the 1981 cubs was sent to Jordan.

The jaguars did not have cubs this year but one of the 1981 litter was sold to Ravensden and the other had to be humanely destroyed due to an injury.

A male puma was sent to Chester on breeding loan, and a pair of jungle cats were received from them on the same arrangement. They were still in the Animal Hospital at the year's end for internal quarantine purposes.

In order to encourage our cheetah to breed, it was decided to move our male on breeding loan. Following the failure in 1981 to make a simple exchange with Glasgow Zoo, it was necessary to obtain a male from the Zoological Society of London on breeding loan, and then to send our male to Glasgow.

The arrangements for overcoming our hyaena problem went sadly awry when both females on loan to us from Amsterdam Zoo became ill and died. This was puzzling as both the animals were

healthy and were being kept in accommodation that had been used by our own hyaenas for many years. The most likely cause of death was their having eaten large quantities of whin, which was a feature of the exhibit area, and it is possible that toxicity from the whin may have brought about their death. The lesson learned from this unfortunate incident is that animals coming from exhibits lacking vegetation must be carefully watched when going into an area with a number of plants.

The brown bear cub was sent to Jordan, and keepers were extremely surprised to find the female Molly absent too. There was some concern that she had managed to escape, but a large and recently excavated hole suggested that she might have gone into hibernation. Before there was time to investigate this she re-appeared briefly during a spell of warm weather, to the relief of everyone, and then settled back into hibernation.

Early in December the entire Zoo was shaken by the news that our twin female Polar bears, Nanuk and Anouska, had died within twenty-four hours of each other. Public concern over this double tragedy has been very much in evidence, but a credible explanation of the deaths has proved more elusive, despite exhaustive pathological and environmental examinations.

Both bears were fit and well prior to being confined in their newly constructed cubbing or maternity dens. The provision of these dens formed part of the received wisdom which has brought breeding success in other Zoos, and an attempt to simulate natural conditions. Within two weeks both Bears had died.

In the wild females are mated in March and dig themselves maternity dens in the snow and ice by October. These consist of igloo shaped hollows in the ice with only an air hole to the outside world. The females give birth to one to three cubs in November to January; these are very small naked objects and the mother rears them underground until they are furred and active. During this period she does not feed and is in a state of semi-hibernation. She digs herself out in the Spring when the cubs are over two months old.

In captivity it is difficult to get females to rear their young if they do not have a pseudo-igloo, and most successful Polar bear breeding in recent years (since the 1950's) has been by Zoos that have constructed such a den. Female Polar bears in captivity usually have to be shut in the maternity den and disturbed as little as possible.

The Society has been keeping Polar bears since the first male arrived in 1913. In the late 1920's the Zoo's first cubs were born to Sheila, but were found to be dead.

Until 1945 breeding continued but the lack of proper facilities for maintaining young meant that no viable cubs could be expected.

From 1947 only female Polar bears were kept at the Zoo, and obviously breeding was not possible, but the pair survived right through to the mid-seventies and were great favourites with the general public.

In 1977 Nanuk and Anouska came to the Zoo as year old cubs, gifted by the Canadian Government.

After a period in quarantine in the area now used for the rockhopper penguins, they were introduced to the Polar Bear Exhibit and left to settle in. Later a young male was received on breeding loan from the Zoological Society of London and was seen to mate during 1981.

In 1982, following the building of a mock-up cage by the Works Department, work commenced under our Manpower Services Commission programme to provide two separate cubbing dens to the rear of the present exhibit. It had been hoped to complete these by the optimal month of October, but in the event they were not completed until late November. This delay may have some significance on the death of the Polar bears.

Again mating had been observed in the early part of the year and on completion of the dens it was decided to move both animals into their individual quarters; approximately twenty-four hours later they were locked in.

The head keeper and his staff who had been involved all along in these developments were instructed that the amount of disturbance to the bears was



One of the rescued acouchis

to be kept to a minimum, this being the recommended procedure for pregnant Polar bears. Only one keeper was therefore allowed to occasionally examine the bears in the cubbing dens and this was done through a special viewing aperture. The bears took some time to settle, but after about a week, it seemed to the observing keeper that the animals were quietening, becoming slower in their movements and giving every indication of going into the state of semi-hibernation, characteristic of this stage. In retrospect the real tragedy of this was that in any other circumstances, bears behaving in this way would have created alarm in the animal supervisory staff, but of course on this occasion the quieter they became the more certain were the keepers and those to whom they reported, that everything was going to plan. Following a close examination when suspicions were aroused over a total lack of movement, it was discovered that one of the bears was dead and it was quickly ascertained that the same was true of the other. Immediately, a post mortem examination was made at the Royal (Dick) School of Veterinary Studies, but an extensive post mortem did not indicate any gross problem with either of the animals. By the end of the year no further information had been forthcoming from other tests that were being carried out, both by way of additional histology on body organs and by examination of the fat for signs of chlorin or other toxic substances. Some concern was expressed over the water system which was tested prior to the bears being enclosed and found to be working, albeit at a high pressure, and subsequent examination following their death, also indicated that there had been no freeze up or other malfunction. Although special arrangements are made for watering bears in zoos, in the wild it is likely that they require little if any water and indeed such evidence as there is suggests that there is a complete lack of use of kidney, bladder and digestive tracts during the period October to April. Thus in the wild, Polar bear breeding dens contain little evidence of faeces or urine. Those carrying out the post mortem did not consider the state of the organs was such as to suggest that dehydration had been a problem. (Results received before going to press have shown no indication of dehydraton or of toxic problems).

However it was discovered that

neither bear was pregnant and therefore the very conditions intended to induce a state of semi-hibernation—being locked in during pregnancy—may have in fact been sufficiently stressful to bring about their deaths. It also seems likely that the bears could hear each other, although confined in separate dens, an additional source of anxiety perhaps.

The probability of two animals, albeit twins, dying of stress within such a short period of time must be exceedingly low, but coincidences are a fact of life and the lack of any positive pathological or histological evidence as to the cause of death must add credence to the stress hypothesis.

For the future alterations will be made to the cubbing procedure and the female, once we have one, will certainly be given longer to settle in an enclosed area.

It must be made clear that it is unlikely that, had others been involved in watching the behaviour of the bears, after they had been locked in their dens, they would have arrived at a different conclusion from the keepers concerned. A closed circuit television monitoring system might have improved the quality and quantity of our observations but in this instance the decisions taken from the information available cannot be faulted. It is obviously disappointing that after years of keeping Polar bears without successfully breeding them, and having spent time, effort and resources in providing satisfactory cubbing accommodation, a tragedy such as this should have occurred.

Ungulates. The year appeared to be a trouble-free one for Dali the elephant. Our single female giraffe was joined by a most attractive sixteen month old male which had been born at Blackpool Zoo. This animal took the journey from Blackpool to Edinburgh extremely well and it was possible to unload him directly from the trailer into the compound without unloading the crate. Once into the exhibit area he seemed to settle immediately with the female. Although there was some concern at the end of the year that he was not feeding as well as could be expected, this problem appeared to have been resolved.

Our pair of white rhinoceros continued to be productive, and in September a male calf was born. There were no problems with this animal, and the female proved again to be an excellent mother. The pygmy hippo female and her calf continued to be kept apart from the male in the early part of the year, but in the summer he was reintroduced to them and there were no complications.

The beginning of the year saw the departure of the last of our nilgai, and at the same time the blackbuck which shared the West paddock with them were moved to the new exhibit area in the East field, where they looked extremely well. There were two births during the year, but unfortunately one calf died. Following the redevelopment of the West paddock the red lechwe breeding group were moved from their East paddock which had become too small for the enlarged breeding herd. Whilst arranging the transfer of the animals, one of the young females escaped and managed to get first into the Scotus Academy area, and afterwards into a garage at Saughtonhall. The head keeper and director were able to contain the animal in the garage until the arrival of the vet who successfully darted the animal and returned it to the Zoo.

The springbok that were being quarantined for Belfast Zoo produced a male and female calf but unfortunately the female died. In the Spring all the animals, except for one young male, were sent to Belfast on completion of their quarantine.

The two male scimitar horned oryx did very well in the African Plains paddock, and it was therefore decided in the Spring that five females be sent on breeding loan from Marwell Zoo. These travelled from the south most satisfactorily, were introduced to the male selected to go with them, and, after a period of containment within the hard standing area, were allowed on to the hill, where they were a source of attraction along with the zebra and red lechwe. Fears that there might be problems with either the zebra stallion or the red lechwe proved to be groundless, and the animals, as they would in the wild, stayed together in their specific groups.

The other male oryx was moved to the West holding paddocks and is kept as a back-up animal.

In the zebra herd the first foal of the year, a female, was injured, possibly by the stallion, and had to be removed for rearing in the Children's Farm. There were three other births in the herd, but two died, as did one of the older females. Also on the hilltop the Highland cattle produced two bull calves, and the group of guanaco produced a male and a female calf. Soay and four horned sheep produced the usual crop of lambs, and the red deer produced two calves.

We experienced something of a disaster with the roe deer. The male attacked a female that was introduced and killed her, and then at a later date turned on his mother and also killed her. A pair of muntjac were received from the Zoological Society of London on breeding loan, and were placed in Whitson Wood. Not long after their arrival a calf was born, but unfortunately, despite efforts at hand rearing, did not survive. The barbary sheep produced three lambs, but only one survived. Three young were born to the duikers, and two survived.

Despite modification to the Tapir House in preparation for a birth, the young animal only survived for a few hours. This was the second born to this female, and both times they have died.

Other Mammals. A female capybara was sent to us on breeding loan from the Zoological Society of London, but unfortunately she was totally incompatible with our male, and as a not unexpected result there were no births during the year. Parma and Bennetts wallaby produced young over the year. The dama wallaby hut was burned down, but fortunately none of the animals were hurt by the fire which totally destroyed their accommodation.

The western grey kangaroo group remained the same during the year, although at the year's end it was obvious that two of the females had joeys in their pouches. One young male bred in our collection was sent to Blackpool Zoo.

The grey seal produced a female pup and this and the previous year's pup were sent to other collections early in the year.

Birds. It was a busy year in this section as an effort was made to ring or beak mark all the birds, and this was completed at the end of the year.

The two pairs of cassowaries laid a number of eggs, one pair proving fertile, out of which one chick hatched and was successfully reared. One of the spare cassowaries was exchanged for four rheas, and these young birds were placed in the lower half of the former Red Lechwe Exhibit, where they have made great progress.

The Section has been trying for a number of years to breed eagle owls, and following a rearrangement of birds to obtain true pairs, eggs were laid, and two chicks hatched and were successfully reared. The snowy owls continued to be highly productive and seven chicks were reared. The golden eagle laid two eggs, but failed to incubate them. These proved to be infertile and laparoscopic examination of the male eagle later in the year proved that he was not fertile. The common kestrel produced three chicks. The secretary bird, who had been in the collection for many years, died.

The grey heron built a nest in the temporary Wading Bird Aviary and laid five eggs, but none of them proved to be fertile. These birds together with the sacred ibis were moved to the new Wading Bird Aviary once this was completed.

The ring-necked parakeets laid a number of eggs, and although at least four chicks died, a further three hatched and were reared. A number of red-rumped parrots hatched, and the moustached parakeet bred, but unfortunately did not rear their chicks. The cockatiels were again highly productive and thirty-five were reared, a far better record than the budgerigars who only reared two. The yellow-headed amazons produced three infertile eggs, and later hatched a total of four eggs, but failed to rear any of them, despite the fact that a keeper attempted to hand-rear one. The black-headed conures successfully reared two chicks, but the green-winged macaws failed to rear one they hatched for the first time.

Following sexing, two female sulphur crested cockatoos were exchanged for two males from another collection, and it is hoped that the resulting two pairs will breed successfully. The zebra finches hatched and reared twelve young during the year.

The flamingoes nested once again and one Chilean was hatched and successfully reared. Another one from a later egg was hatched in an incubator but died of yolk sac infection.

In the Pheasantry there was considerable success, including the hatching and rearing of three white eared pheasants. Other pheasants reared included golden, reeves, kalig, cheer, and yellow-golden. Following the discovery that our bird was a female, we obtained a male kea on loan from the London Parks and hope we shall now be able to breed this species.

Penguins. Nine pairs of king penguins laid eggs, but only two hatched and were successfully reared. Only one adult died during the year, making a net gain of one, which has at least drawn a temporary halt to the downward trend of this flock. The sexing of these birds showed that they were nicely balanced and it was decided that there must be some other cause for the low success rate for this species. It has been found that the Vitamin A level in birds in captivity is about twenty times lower than in the wild, and at the end of the year plans were being made for supplementation of vitamins in 1983.

The gentoo penguins laid ninety-six eggs, of which thirty-four hatched, but, with a few deaths during the last month, only twenty-six survived. Gentoos were sent to Blackpool, Bremerhaven and to Lincoln Park, Chicago.

It was hoped to repeat the success of last year with the rockhopper penguins. Three pairs were nesting and four eggs hatched. Three chicks taken for hand-rearing were doing well for a week, but then all died within hours of each other. Although the post mortem was inconclusive, it was thought that either the food became infected or there was overheating from the heat lamps. One egg was hatched by the parents and the chick was left with them, but, as in the past, did not survive long. The 1981 chicks moulted into their adult plumage in June, and continued to flourish. Two females were received on breeding loan from Bristol Zoo.

Reptiles. The increasing skill of this section was recognised by the presentation on breeding loan of two male and four female plumed basilisk from the Jersey Wildlife Preservation Trust. This loan of endangered reptiles forms part of a co-ordinated breeding programme.

The broad fronted crocodiles in their new enclosure would not mix satisfactorily and it seemed likely that one of these animals would have to be moved to another collection.

A boa was lent to the MacRobert Centre for a pantomime in the early part of the year. A new arrival to the collection was a pair of rhinoceros iguana.

There was considerable breeding success during the year, and this included a number of first-time births. It seems likely that the mud turtle which laid eggs in April, of which six hatched and three survived, and the turnip-tailed gecko, of which two hatched in May, were first breedings in the United Kingdom.

The water dragons laid a number of eggs throughout the year; the first, early in the year, proved fertile but the young died in the shell, but there was better luck later in the year when a total of fourteen hatched and eight survived. Eight blue-tailed skink eggs hatched and three survived, and there were eight blue-tongued skinks born.

Other reptiles that laid fertile eggs included the banded basilisk, green lizard and tokay geckos. The leopard gecko laid a number of eggs and thirteen of these hatched and were successfully raised.

The red eared terrapin laid infertile eggs at the beginning of the year, but later on fertile eggs were laid, of which four hatched and one survived.

Two species of amphibians bred successfully: the common toad spawned in April and the fire bellied toad in May.

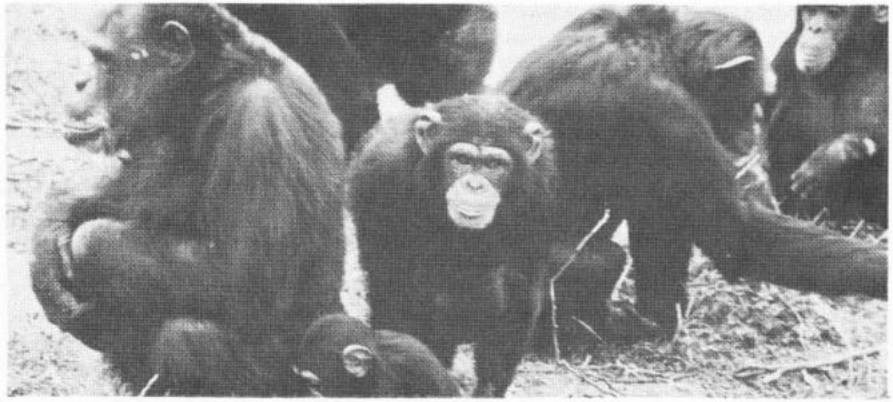
The Reptile Section thus went from strength to strength in their breeding programme. Although there were fewer species on display there was a higher proportion laying fertile eggs.

SUMMARY OF ANIMALS IN THE COLLECTION AT 31.12.82

Titles to be used for each column as numbered: 1—Total in Collection 1.1.82; 2—Received from all sources in 1982; 3—Bred 1982; 4—Died within 30 days of birth; 5—Died from natural causes; 6—Departed all other reasons; 7—Total in Collection 31.12.82; 8—Species.

	1	2	3	4	5	6	7	8
Mammals	327	58	90	37	55	54	329	72
Birds	619	65	210	53	90	217	534	105
Reptiles	128	40	80	19	42	25	162	37
Amphibians	28	18	74	0	51	33	36	9
Totals	1102	181	454	109	238	329	1061	223

Not included: white mice, rats, guinea pigs, rabbits, moorhens and budgerigars.



Some of the chimpanzees in the Playground

Rare and protected endangered Parma Wallaby only from us. N.Z. Govt. permit. Before they all get destroyed as a noxious animal in their small 5000 acre island here. Save these by ordering from us... NOW. Illustrated list of other wallabies also available.

D.E. Hopkins Ltd., Wallaby Farm, Box 135, Warkworth, New Zealand.