







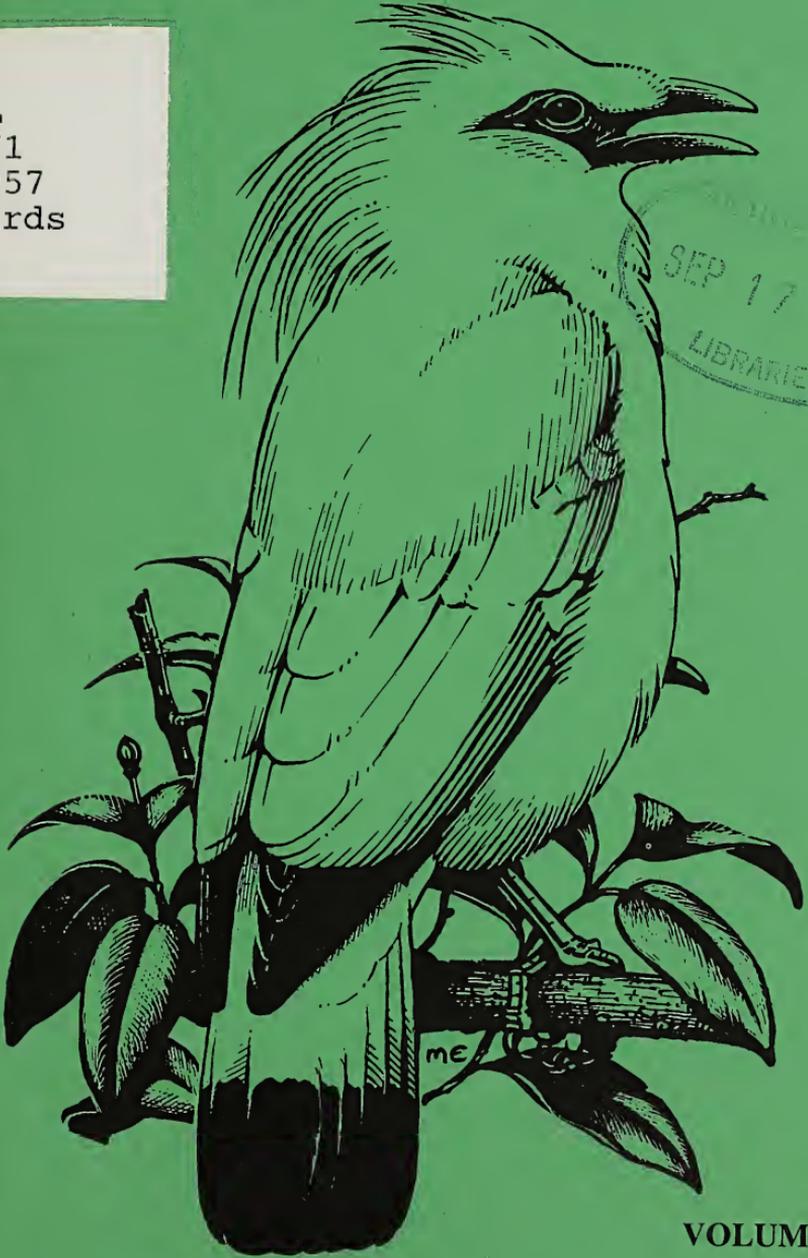


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# AVICULTURAL MAGAZINE

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## CONTENTS

Editorial – .....	1
Obituary – Mary Harvey .....	2
Breeding the Red-flanked Lorrikeet. By Dulcie Cooke .....	3
The 1990/91 Breeding Season at Mitchell Park, Durban, S.A. By W.D. Cummings .....	9
Professor Carl Albert Naether By Josef H. Lindholm III .....	14
A Review of the 1990 Avian Breeding Successes of a Mixed Species Rainforest Exhibit By Rosemary Krussman .....	25
Breeding the Buffon's Touraco By S.C. Horne .....	35
Breeding of Duivenbodes Lory By K.W. Dolton .....	37
Breeding Blue-crowned Motmots at Kilverstone Wildlife Park By P.F. Larcombe .....	38
News and Views .....	41
Review .....	46





# AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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## EDITORIAL

It is not much longer than a year since Harry Horswell died after being secretary of the Avicultural Society for almost twenty years. Now the Society has sustained another grievous loss in the death of Harry's wife, Mary Harvey, who had served the Society for the same length of time, first as Assistant Secretary and, from 1981, as Editor of its magazine. She died in February after a long and debilitating illness. Many of us remember her as the tall, attractive girl whose charm and gracious manner complimented Harry's good humour to make the social events of the Society so very enjoyable. We also remember how hard she worked to maintain and improve the literary style, format and content of the Avicultural Magazine. She will be sadly missed.

The secretarial affairs of the Society are now in the capable hands of Geoffrey Greed and I have agreed to take on the editorship of the magazine. Although Mary had been ill for a long time her death occurred suddenly and unexpectedly. She had been more seriously ill than anyone appeared to realise and consequently her editorial activities had become a severe burden with which, sadly, she was coping only with extreme difficulty. Many letters were unanswered and some manuscripts were lost and so I should be grateful if any member who has submitted material for publication, the receipt of which has remained unacknowledged, would write to me.

Already, I have become acutely aware of one of the problems which have confronted editors of the Avicultural Magazine since its inception almost a hundred years ago and that is the scarcity of suitable material to fill every issue. I hope to broaden the spectrum of interest of the magazine by including as many interesting avicultural news items as possible and by incorporating articles on the bird collections in the many zoos and bird gardens which now exist. There must be many members with interesting news to record about their birds and so I appeal to everyone to contribute something to the magazine. Although the Society organises numerous enjoyable social events, its membership depends mainly on the interest and success of the magazine. To remain financially viable we must attract

more members and, to do this, we must improve the magazine. It would be a tragedy if the Society were to fold up now within a few years of reaching its centenary.

J.R. Hodges

### OBITUARY

#### Mary Harvey

Mary Harvey, editor of the magazine since 1979, will always be remembered by many members of the society for her charm and the welcome she always extended to everyone. Her presence at virtually every social meeting over the years helped to ensure the smooth running of each event and to integrate new members into what is surely one of the finest societies for Aviculturists in the world.

As an editor, Mary was outstanding, maintaining the very high standards for which the magazine is known worldwide. Always courteous and understanding, her's must have been a very considerable task to mould the work of so many writers into the very particular style which has always set the Avicultural Society of Great Britain's magazine apart from all others throughout the world.

To so many of us, there was only one "Mary", she will be greatly missed.

Dulcie Cooke

\* \* \*

## BREEDING CHARMOSYNA PLACENTIS, THE RED-FLANKED LORRIKEET, IN A SMALL INDOOR AVIARY

By Dulcie Cooke (Epsom)

Until recent years the Red-flanked Lorrikeet, *Charmosyna placentis* was not frequently imported into the U.K. Recently, however, there have been several importations of members of this species. Joseph Forshaw in "Parrots of the World" describes five subspecies, of which *Charmosyna placentis ornata* has a greater spread of red down the sides of the breast than some of the others. For those who are not familiar with these delightful members of the *Charmosyna* group of Lorrikeets, a rough description may be of interest. The length is about 6¾" (17cm) the weight approximately 1½oz (42g). The sexes are dimorphic, so much so that at first it is difficult to realise that the very beautiful green hen with her huge gold-streaked ear patches belongs to the same species as the flamboyantly coloured male. The body of the male is a uniform deep green which admirably sets off the colouring of the head which is lime green on the forehead and crown. The brilliant scarlet cheeks make a perfect contrast with the huge violet ear patches. The bend of the shoulder and sides of the breast and flanks are a vivid scarlet, the rump is dark blue and the undersides of the tail are orange, red and black. The bill is scarlet, the legs orange-red and the very large eyes are orange-yellow. The female, as described above, is green all over with exceptionally large ear patches of bright gold streaked with blue-black. The young are like the female but males show some red around the face from a very early age.

These birds inhabit the Moluccan Islands in Indonesia, parts of New Guinea and Islands in that area as far as the Bougainville Islands in the Solomons. In their various native homes, they frequent mainly lowland forest areas, going in groups from one flowering tree to another. They have also been observed in Coconut plantations. In Papua New Guinea they have been seen in highland areas at about 1150m. In the Southern Moluccas flocks have been observed visiting coastal areas. In their wild state these birds nest in arboreal termitaria or in giant ferns.

Until recent years this lovely bird was considered difficult to adapt to life in Europe, and was an extreme rarity. Rosemary Low states in her book "Parrots, their care and breeding" that Mrs S. Belford imported a pair in 1977, and since that time these birds have been

bred here, in Europe, in the U.S.A. and no doubt in many other parts of the world as well. Possibly improved conditions for birds during transit from their original areas to their many avicultural homes in various parts of the world have greatly improved their chances not only of survival, but also of a healthy, happy life and the successful reproduction of their species. They certainly do seem to take rather longer to adapt to conditions of housing, food, temperature etc than some other Chamosynas; for example, the beautiful little Fairy Lorrieket, *C. pulchella*, seems to come sailing through all sorts of conditions which would be too much for a Red-flanked to endure.

In the summer of 1989 my husband Freddie and I obtained a pair of Red-flanked directly from an importer. They were in immaculate condition and appeared to be fairly young. They have remained in this excellent state of health ever since. However it must be said that they were kept at a permanent temperature of 74°F for the first year and there were times when the cock used to sit looking "puffed up", then quite suddenly he would shake himself and go back to his sleek immaculate appearance.

The birds were established in a small indoor birdroom with a window facing south and an airbrick high in one wall which was partially screened by a pocket shaped plywood screen. The lighting consists of a low watt ordinary hanging electric light with a shade, this is on night and morning and acts as a "dimmer". The real lighting comes from a four feet Tru-Lite strip light, which is switched on for 12 hours per day. In exceptionally brilliant sunshine in the summer it is sometimes switched off for a few hours. The advantage of Tru-Lite (used for aquaria) is that it's spectrum of light is such that the birds are able to synthesize Vitamin D3 which enables them to make full use of their calcium intake, required for egg laying, bone building etc. Heating is supplied by means of radiators using the house central heating, on twice per day, morning and evening and set at 68-70F. When this is switched off a Convector electric fire takes over, it is thermostatically controlled at 68°F.

The aviary-cage which the Red-flanked inhabit measures approximately 5' long by 2' deep by 3' high (about  $1\frac{2}{3} \times \frac{2}{3} \times 1$  m high). Two pairs of double doors, one above the other, service this little aviary. The roof is plywood at the back, and twilweld in front, the sides are half plywood and half twilweld mesh (in front). The back is plywood. The framework is constructed of finished 1"x1" wood. The back and sides are lined with white Formica for reflected light and ease of cleaning. The floor is of thick ply to give stability

and the rather deep trays are of aluminium. The depth allows a layer of wood shavings to be used as a floor covering where necessary. In fact most of this floor is covered with newspaper of which some parts are renewed daily.

This aviary stands on a 3' (1m) high table with a Formica top, which has been specially constructed as a base. Underneath the table is useful storage space. The perches are of ½" (1.27cm) dowelling, and there are always a few small branches or twigs of hazel nut fixed between the wire front and one of the perches. The aviary faces west, so gets a lot of sunshine in the summer months. The nest box, which is high up near the right hand pair of doors faces north. It is 7" × 7" × 12" deep (18cm × 18cm × 30cm) and has an inspection door which faces the top right hand service door, so it is quite easy to see what is going on in the nest. The box contains a very small ladder. The nesting material is a small quantity of brown peat at the bottom of the box with about 4" (10cm) of soft wood shavings. These are quickly broken down by the birds to a flat "platform" and the nest is most of the time scrupulously clean.

The birds had slept in the nest box almost from the start of their lives here but it was not until the spring of 1990 that they showed serious signs of going to nest. Where many imported Lories and Lorrikeets quickly became ultra tame, the Red-flanked, although "steady", were always extremely nervous of visitors. This was unfortunate because some later additions to the birdroom in the form of a pair of Red-spotted Lorrikeets, *Charmosyna Rubronotata* housed in the opposite (east facing) aviary caused considerable interest amongst our visitors. Unfortunately this proved too much for the Red-flanked, and although no visitors had been allowed to enter the room but only to view the Red-spotted from the open door, the Red-flanked decided that was just too much, and they deserted the two large white eggs which the hen had laid.

With this experience gained, all visitors to the room were banned, the door being tightly shut at all times. After a period of nearly three months the hen laid again, and yet again I experienced a nervous time after the one quick look to establish that there were in fact eggs again in the nest. She did not return to the nest for a day and a half. Eventually, much to my relief she went back to the eggs, and the cock stood guard on top of the box. In 25 or 26 days, the faint cries of a very tiny baby could be heard, but I did not dare to investigate. Quite a lot of nectar was consumed at this time and also some of the dry food which all our Lories and Lorrikeets receive fresh daily. When I judged the baby to be about three to four weeks of age the

inspection door to the box was opened one morning when both parents were out of the nest, which in the case of the hen was not often at that time. In one corner of the nest box was a lively little bird sitting over an egg which was clear. This was left with the baby since it formed a very useful "hot water bottle". The chick was covered in quills which gave it a very dark green appearance. It was a very friendly baby and ran about the nest, and at that time called incessantly to be fed, even through the night, calling especially loudly each night at about 1 a.m! At approximately five to six weeks of age the baby was fully feathered except for the back and front, and had a very short tail. At a surprisingly early age, (I judged it to be between six and eight weeks old) the baby emerged from the nest. It's tail was still very short indeed, and it had golden streaked ear patches like it's mother. The chick was very friendly at that stage and allowed itself to be caught and put back in the nest at night for the first three days. On the fourth day out of the nest towards evening the baby flew on to the top of the box and a little later disappeared for the night. From that time onwards the baby bird became very independent and refused to be caught at night, driving its tired and sleepy parents mad while it played about! One morning it did allow me to pick it up to be photographed, but I had to hold it very firmly because it was so lively.



Young hen Red-flanked Lorriquet bred in an indoor aviary.

This very clever chick quickly learned where its parents obtained their food, and started to feed itself, although of course also calling

for food from the parents. Now at over three months of age it has become obvious that the chick is a hen, no red whatsoever has appeared anywhere on this bird. She was taken away from her parent's aviary at approximately three months of age, because they had gone back to nest. The parents were some of the most attentive, and later tolerant, I have ever known.

During the time the mother was producing a further two eggs both the father and the baby hen spent most of their time in the nest box with the mother. However it was obvious from the squabbles which could be heard at night coming from the box that all was not well. One day the baby hen flew desperately towards me several times when I was changing the paper floor covering, something she had never done before. She allowed herself to be picked up and I noticed a tiny mark near one eye where she had been pecked and a couple of feathers removed, otherwise she was unharmed. The baby hen was removed immediately to a cage in a room already rather full of young birds, babies in a brooder and adults who needed some warmth for the winter and whose aviaries could not be heated sufficiently for their complete comfort; so some of them were taken out most days in carrier boxes to their aviaries and brought back at dusk to spend a warm comfortable night indoors. All this activity from three other species of Lories and Lorrikeets was an admirable introduction to the great wide world for the baby hen. She had come from a birdroom where the temperature is kept now at a steady 68F and she had to get used to a temperature which varied between about 60F during the day and about 70F at night when the central heating made the whole house warm.

All our *Charmosyna* Lorrikeets receive a small quantity of pure Australian honey daily. In the case of the Red-flanked it amounts to about a quarter of a teaspoon divided between two nectar feeds per day. The nectar fed to these birds consists of about three heaped tablespoons of fruit or cereal based baby food (usually Milupa and, if possible, *not* those containing citrus fruits), one tablespoon of glucose, one *teaspoon* of Soya Bean Flour (from Health food shops), one level tablespoon of Muscavado medium brown sugar, one teaspoonful of pure Australian honey and one level tablespoon of liquidised peeled carrots and peeled and cored sweet apple (one medium sized carrot to two medium sized sweet apples). During the winter and when breeding ten drops of Adexolin (a proprietary preparation containing vitamins A, C and D) is added to one feed per day. About twice per week a little finely scraped very white Cuttlefishbone is added to the nectar. The birds do have

Cuttlebone in their aviary, but unlike some of the larger members of the Lory family they do not appear to eat it when presented in this form. The dry food given consists of three tablespoons of fruit or cereal based baby foods, as above, one heaped tablespoon of glucose, one level *teaspoon* Soya bean flour (from Health food shops) one level tablespoon of granulated cane sugar and one tablespoon of wheat bran (from Health food shops). This is given fresh once per day and replaced if it becomes damp or fouled. It does help to encourage the birds to eat this food to sprinkle a tiny quantity of granulated cane sugar on top of the mixture. The birds ate some of it daily when they were feeding their baby, and now she is a regular daily consumer of this dry food. I usually put a tiny amount of very finely cut sweet apple in one corner of the little bowl containing the dry food.

Green food is given fresh daily round the year, usually endive, but sometimes watercress or lettuce. Occasionally some tiny twigs of hazel nut with the leaves removed are put in the wires to give added amusement, and for about nine months of each year a daily supply of pollen bearing flowers is given to the birds. These can be winter flowering heathers, roses, wild Honeysuckle (the evergreen garden type is toxic), forgetmenots, wallflowers, impatiens (busy lizzies) and the biggest favourites of all, a constant supply of fuchsias. Nut catkins can also be given. All types of wild flowers have so far been ignored. Perhaps it would be helpful to point out that all parts of rhododendron flowers are poisonous, and honey from these flowers can be very toxic.

The breeding of this little hen has been a delightful experience, and it has been a joy to watch the devotion of the parents, both to each other and to their offspring.

\* \* \*

## THE 1990/91 BREEDING SEASON AT MITCHELL PARK, DURBAN, S.A.

by W. D. Cummings

Mitchell Park Aviaries has quite a wide variety of birds in its collection and so every breeding season has its surprises but this season has, to my mind, been one of the most satisfying. Two species which have eluded me over the years have bred – the beautiful Hartlaub Duck *Cairina hartlaubi*, for the first time in South Africa, and the Crested Guinea Fowl *Guttera edouari*.

A colleague of mine imported two pairs of Hartlaub Ducks from Belgium over ten years ago and offered one pair to us. Our pair was kept in a thickly planted aviary containing two small inter-leading ponds and they settled down well and were quite tame. There was a collection of smaller birds in the aviary, including Pigeons, Doves, Mynahs, Orioles and Finches. Their diet included moistened duck crumbles, minced ox-heart, duck weed, chopped lettuce and pond weed and they could help themselves to the corn mixture supplied to the Doves, etc. The following year the drake was seen mating with the duck on the pond several times and we supplied three different types of nesting logs and boxes at different heights to entice them to lay but to no avail. They were fully flighted and perched at different levels in the aviary, but the duck was never seen looking into any of the logs. This performance went on for year after year – mating, but no nesting, and the other pair belonging to my colleague behaved in the same way. They would display regularly to each other and were inseparable. Vocally the sexes are entirely different – the duck making a low guttural quack and the drake a low muscovy-like hissing sound. Colour-wise the sexes are similar but the duck is a little duller chestnut and the white spot on the head of the drake becomes a small, narrow strip of white above the beak of the duck which sometimes lacks the white spot altogether.

Our Hartlaub Duck died after eight years and my colleague's also died the year before. So we were left with two approximately ten year old drakes. An importer in the Transvaal was building up a collection of waterfowl to import from Europe and I asked him to keep a look-out for one or two Hartlaub Ducks but, not thinking for a moment that he would be successful, I also applied for a Veterinary Import Permit from the South African Authorities to bring one in from their country of origin – West Africa – but this was rejected. I understood that they were not readily available from waterfowl



Hartlaub Ducks and ducklings.

collectors in Europe and were not frost-hardy. So imagine my surprise when the importer informed me that he had an adult breeding duck for me and he had imported a young pair for himself.

When she arrived after a month in the quarantine station, I collected the Hartlaub drake from my colleague, and put him and my drake (both now over ten years old) in with the duck – all three together but with some trepidation for they can be very aggressive and my old drake had already killed a full-winged Ringed Teal drake which slipped into his aviary through a hole in the adjoining partition, in two minutes flat. He was also totally intolerant of other ground birds like Black Crake and Pheasants, but this aggression usually peaked during the breeding season. There was very little reaction between the three birds – neither drake attacked the other but after a week it appeared that my colleague's male was more interested in the duck than was mine, in spite of the fact that this male had been in isolation for three years since his mate died. There was no displaying but the two birds seemed to move around together and so I took the other male out.

The following Spring I saw the drake mating successfully with the new duck, and told the attendant to check up on the low duck box – for this duck was pinioned and so could not reach the higher boxes. He said there was nothing there and this went on for several weeks until I got a bit anxious and told him to look into the box again while I was there only to be told there were three eggs covered over with

leaves. She was so quiet and furtive that although the attendant had been in and out of the aviary all day, he had never seen her in the nest box. Their colouring and the fact that they tend to remain stationary in shadows means that they are often overlooked. Eventually she went brooding on nine eggs and sat tight. We never once caught her off the nest so that we could examine the eggs for fertility. Eventually, after what seemed a very long time, on approximately the 28th day, we decided to check the eggs and had to remove the duck from the nest for she attacked your hand while she was sitting on the nest. We found the eggs now chipping and we decided to remove them to place them under a broody Bantam hen to hatch. Five ducklings out of the nine eggs hatched – the rest of the eggs were infertile. We considered that removing them was the safest method, thinking that the ducklings would probably be weak, considering the age of the male Hartlaub and we also had no experience or knowledge of the maternal instincts of this breed of duck. The weather that weekend, as often happens with an exciting event, was atrocious and raining heavily all the time. I preferred to know that the ducklings were cosy and dry under cover – at least I could sleep well. In any event, they were large, strong and healthy, and a comment was made that they looked like young Muscovy ducklings with their longish bodies and distinctive black eye streak, and probably were – and this by the jealous colleague who imported the Hartlaub duck! His young imported pair laid infertile eggs and laid only the one clutch.

Our pair went to nest again within two weeks of our taking the first clutch away and again we let her sit but this time we removed the eggs after two weeks and placed them under a broody Pekin Bantam hen. The Bantam hen hatched eight Hartlaub ducklings – one egg was infertile – and she reared all eight.

With this brood we tried a new high-protein diet in addition to the regular foods and this caused some variation in growth and two or three had dropped wings, which was corrected, when we realised what the problem was, and we withdrew this food. We understood that the Hartlaub Ducks are high protein feeders in the wild and the first brood of five ducklings were particularly active in darting around their pen catching flies but this behaviour was not noticeable in the second brood. However, apart from a balanced duck-growth food and minced ox-heart, we gave them regular dishes of small fish (guppies) as additional protein and these they consumed avidly. But in all we found the ducklings easy to rear and did not need tempting to feed.

Summer was now nearly over and we were very satisfied with 13 healthy Hartlaub ducklings but still the adult pair had not commenced to moult. Imagine our surprise when the second brood under the hen were three weeks old, the Hartlaub duck was seen in the same nest box again and we discovered another three eggs. She laid a third clutch of nine eggs and then went broody and this time we decided to let her sit the full time and rear the ducklings, if any, herself. She hatched nine ducklings. The weather now was getting colder at night and the aviary they were in did not get a lot of sun, so we caught up the adult pair and the nine ducklings and put them in a smaller, more sheltered and sunny aviary to give the ducklings a better chance for development. She proved a model mother and the drake was also very protective of the brood and the ducklings are now nearly three months old and are developed identically in size and seem on the whole finer specimens than the other two broods (reared under hens).

Of course the last brood were swimming around from day one whereas the other two broods reared by the hens were only introduced to bathing when they were feeding well at about ten days old and were fully water-proofed at three weeks old – and this activity alone could vary development. So in all we reared from the one pair of Hartlaub Duck 22 healthy ducklings. To follow up, a young duck from the first brood of five hatched is now pairing up to the old drake of the original pair and they are just beginning their courtship display – so that will then give us a second un-related pair of Hartlaub Ducks for breeding.

We left eight ducklings full-winged – the others we pinioned – and the full-winged ones are extremely nimble on the wing for such large duck and enjoy perching and are obviously highly adapted to thick jungle conditions. We found full-wing perching ducks generally make far better breeders when they have the opportunity to nest high – one example is our Rajah Shelduck of which one full-winged pair nested four times in one year (1989) and we reared 32 ducklings from them whereas the same pinioned birds are very reluctant breeders. We find the same with Ringed Teal, Brazilian Teal and Chestnut Breasted Teal.

The Crested Guinea Fowl *Guttera edouari* chicks were easy to rear, unlike the Vulturine Guinea chicks *Acryllium vulturium*. The latter seem very prone to worms and infections.

We were very pleased to rear young S.A. Cape Parrots *Poicephallus robustus* for the first time after trying for years with several pairs, but the main problem with these parrots that springs

to mind is that they are very selective over their partners and one can sit for years with an adult cock bird and an adult hen together in an aviary, but they will not pair together.

The hen of one pair in the Park died after many years of not breeding so I put the remaining pair (also adults but non-breeders) in together with the remaining cock bird. The following day I had to remove the cock bird of the pair for I found him very stressed on the ground and I left the other two together and within three months they had nested. I believe they are also sociable breeders and you have more chance if they are kept within sight and sound of other Cape Parrots.

We also reared three Blue Stanley Crane *Anthropoides paradisea* but the Crowned Crane *Balearica regulorum* were infertile. We also bred a wide variety of waterfowl and pheasants, plus Sonnerats Jungle-fowl *Gallus sonnerati*, three species of Mynah (Black-winged, Crested and Jungle), Occipital Blue Pies *Urocissa melanocephala*, Pied Imperial Fruit Pigeons *Ducula bicolor*, Nicobar Red-eyed Pigeons and Black Crake *Limnocorax flavirostris*.

\* \* \*

**PROFESSOR CARL ALBERT NAETHER**  
**April 27, 1892 – January 28, 1990**

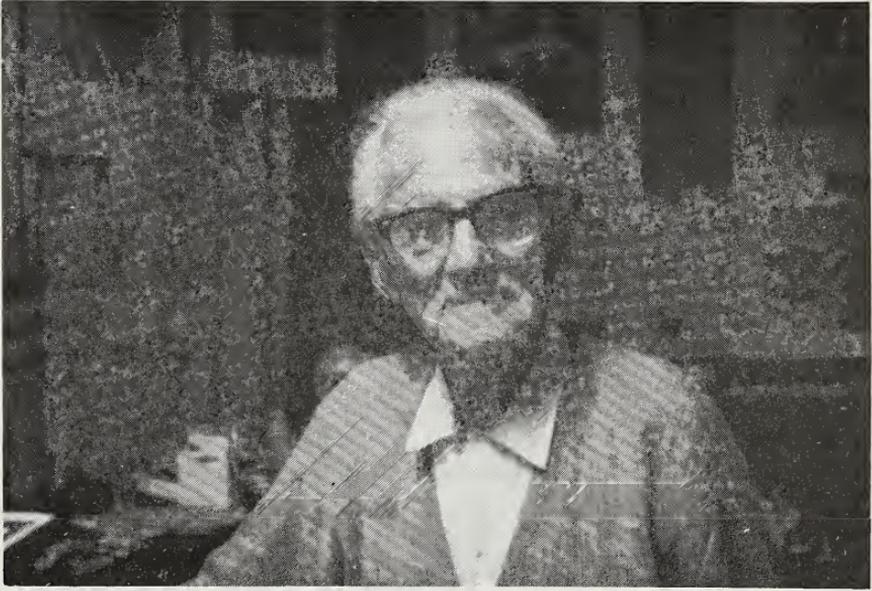
By Josef H. Lindholm III  
 Emerald Forest Bird Gardens  
 Fallbrook, California, USA

On my last visit to Professor Naether, several months before his brief final illness following a fall, he was exasperated by yet another refusal by the East German Government to grant a visa to visit his native Saxony, a trip he planned to make entirely by rail and ship, as he detested airplanes. On the other hand, he was very much amused by the receipt of the *Deutschmark* equivalent of \$67.00 from the editor of *Die Gefiederte Welt*, for his observations on the nests of Feral Pigeons in some Santa Monica palm trees which he had climbed not long before. This typical enthusiasm and gleeful enterprise is evident in the enormous number of articles and reviews which he wrote in English and German for many journals and books on aviculture, photography and rabbit-rearing, as well as in a series of texts on Business Writing which established his professional standing as a Professor of Business English.

Carl Naether was born in Tergau. His father was a government land surveyor who inspired his enthusiasm for natural history by taking him on frequent expeditions and pointing out interesting plants and animals. When Carl arrived at his brother's parsonage in Iowa at the age of eighteen, his command of English extended to "yes", "no", and "telephone". In 1924, at the age of 32, he was appointed Professor of English at the University of Southern California, Los Angeles, after holding teaching positions in Iowa, Utah, South Dakota, Oregon and San Francisco, and obtaining degrees from the University of Iowa, the University of California, Berkeley, and the University of Michigan.

When he was at the University of Southern California he began augmenting his well-established collection of domestic pigeons with wild species, commencing with a pair of Diamond Doves. He eventually developed, with the assistance of Dorothy, his wife for more than fifty years, an impressive collection, in Los Angeles' San Fernando Valley, where he lived for the rest of his life. Though never very large, the collection was distinguished by the presence of such rarities, as the Snow Pigeon *Columba leuconota* (Naether 1965a&c, 1966, 1973 & 1981a), the Scaled or Splendid Pigeon *Columba speciosa* (Naether 1939a, 1940c, 1959, 1961a&c, 1962a & 1973), the

Squatter or Partridge Bronze-wing Pigeon *Petrophassa scripta* (Naether 1939a & 1940c), the Key West Quail Dove *Geotrygon chrysia* (Naether 1962b&c, 1965b, 1973 & 1974a), and the Marquesas Ground Dove (Naether 1940c). Professor Naether bred many species of pigeons and doves and had great long-term success with some, particularly the Key West Quail Dove and the Jamaican Mountain Witch Dove *Geotrygon versicolor* (Naether 1948c, 1960 & 1963a). As is obvious from his publications Professor Naether observed his birds meticulously for many years and was unusually assiduous in recording his observations. These have been extensively cited by many authors and especially by Derek Goodwin (1970) on Scaled Pigeons and Key West Quail Doves.



Professor Naether in his study, June 1989.

Professor Naether's prominence in pigeon and dove aviculture appears to have obscured the reputation he deserves for an equal enthusiasm for softbills. His 1955 book, *Soft-billed birds*, in fact, is the first American book devoted to the subject. It is now, unfortunately, very rare, having been long out of print. I am not certain of the publisher. Professor Naether's softbills were all Passeriformes. I believe he bred only White-rumped Shammas, the significance of his softbill aviculture lying more in his maintenance of mixed collections, with remarkable longevity records. In an aviary 8' x 8' x 16', for instance, pairs of two species of Yuhinas *Yuhina flavicollis* and *Y. nigrimenta* had been maintained, at the time of writing (1966b), for seven years, with twenty other birds, such as a

White-capped Redstart *Chaimarrornis leucocephalus*, a large South American Thrush and Titmice. Among the more unusual of the many softbill species of which he wrote in detail are the Canyon Wren *Catherpes mexicanus* (1951a & 1952d), the Bewick's Wren *Thryomanes bewicke* (1943a & 1951a), the Mexican Blue Mockingbird *Melanotis caerulescens* (1940 & 1947a), the Japanese Robin *Erithacus akahige* (1936b & 1939c), the Ryukyu Robin *E. koadori* (1936b & 1941g), and the Japanese Bush Warbler *Cettia diphone cantans* (1936b, 1951, and 1954c).

It will be noted, in the appended list of his publications, that there is no overlap in the periods during which Professor Naether wrote for the *Avicultural Magazine* and the Avicultural Society of America's *Aviculture*. I believe the commencement of his *Aviculture* era coincides with the reorganization of the Society from a predominately East Coast membership to a largely California one, while his return to the *Avicultural Magazine*, of course, coincides with the merging of the two society's journals in 1951, a situation that was to last for nearly a decade, beyond which Professor Naether continued to write for this magazine.

Professor Naether had many close friends in aviculture, among them Alex Isenberg, Ray Thomas, the president of Columbia Records, and Henrietta Cohen, of the Southern California Bird and Pet Exchange. His closest friend was Jean Delacour, who as Director of Art, History and Sciences for the City of Los Angeles (1951-1961) worked across the street from the University of Southern California, at the Museum of Natural History, which then held the City's art collection as well. Professor Naether's fond reminiscence of Dr. Delacour, published in this Magazine's 1988 Delacour Memorial Issue, presents a protrait of the man contradictory to that of a number of others in that number, but our great past President was, in the words of Saint Paul, eminently capable of "becoming all things to all men"! It was my privilege to hear many stories about Professor Naether's friends. He would sometimes receive an urgent request from Mrs. Cohen, to come to her shop to identify some "rare birds from Asia". He would arrive to find Dr. Delacour, summoned for the same purpose and realize that the reasons for their being there were as much for retail as for identification. Ray Thomas, with the wealth of his company at his command, and an enthusiasm often exceeding the capacity of his aviaries, would just as urgently require the presence of Naether, Delacour, and K.C. Lint, Curator of Birds at the San Diego Zoo, to relieve his over-crowded collection of whatever rarity they wished to take. Professor Naether's favourite

story was of his arrival early in the morning, at Delacour's Los Angeles mansion to purchase a pair of Bleeding-heart Doves. Dr. Delacour interrupted the bemused preparation of his breakfast oatmeal to catch the birds, and with great care, personally selected and presented to his friend – two males!

Though deteriorating eye-sight compelled Professor Naether to give up his birds in the 1980s, his enthusiasm for aviculture remained undiminished. He continued to subscribe to a number of journals and to maintain close contacts with several people, in particular Donald Hanover, whose wonderful collection of Indo-Pacific Pigeons and Doves was not far from the Naether's Encino home. When, in 1989, a pair of Hanover's Pink-necked Green Pigeons *Treron vernans* produced a three-squab clutch (Hanover 1990), Professor Naether was one of the first to be consulted on what may possibly be the first recorded set of "triplets" for any pigeon or dove.

The fifty four years of Professor Naether's articles in the *Avicultural Magazine* and *Aviculture* are certainly a fitting monument to a long and rich avicultural career.

#### REFERENCES

- GOODWIN, D. (1970) *Pigeons and doves of the world* (Second edition). British Museum/Cornell University Press.  
 HANOVER, D. G. (1990) Triplets . . . An unusual breeding of the Pink-necked Green Pigeon *Treron vernans*. *A.F.A. Watchbird XVII* (3) 15.

#### PROFESSOR CARL NAETHER'S CONTRIBUTIONS TO THE *AVICULTURAL MAGAZINE* 1934-1937.

- NAETHER, C. (1934) Nesting notes on Bronze-wing Pigeons *Phaps chalcoptera*. *Avicultural Magazine*. Series IV, XII, 194-197.  
 (1934). When a Mourning Dove falls in love. *Ibid.* Series IV, XII, 265-266. Notes on a Mourning Dove X Barbary Dove cross, with four photographs by the author.  
 (1935). Further nesting notes on Bronze-wing Pigeons. *Ibid.* Series IV, XIII, 151-152. With two of the author's photos.  
 (1935). Breeding activities of foreign doves. *Ibid.* Series IV, XIII, 260-261. Notes on Green-winged Cape, and Galapagos Doves, with mention of a claimed first importation of *Zenaida aurita* by a dealer.  
 (1935). An amateur bird photographer meets a humming bird family. *Ibid.* Series IV, XIII, 325-329. Notes, with five photographs, of birds in a California public garden. The species is not identified, but appears to be *Calypte anna*.  
 (1936). Do doves tell time? *Ibid.* Series V, I, 84-86. Notes on Cape Doves *Oena capensis*.  
 (1936). A beginner tries softbills. *Ibid.* Series V, I, 152-153. Professor Naether's first softbill was a Shama, his second was a Clarino. Other species discussed are Japanese and Ryukyu Robins *Eriothacus akahige* & *E. komadori* and the Japanese Bush Warbler *Cettia diphone cantans*.  
 (1936). Concerning foreign doves. *Ibid.* Series V, I, 217-219. Notes on the use of

Mourning and Diamond Doves for cross-fostering, and the reproduction of Australian Crested and Indian Green-winged Doves.

(1937). Further observations on keeping foreign doves. *Ibid.* Series V, II, 45-48. Notes on reproduction of a number of species, with particular emphasis on Galapagos Doves.

(1937). A homeless young Mocking-bird. *Ibid.* Series V, II, 254-256. Notes on the hand-rearing and eventual release of a locally retrieved fledgling.

(1937). Breeding the Western Mourning Dove *Zenaidura macroura marginella*. Series V, II, 266-267.

#### PROFESSOR NAETHER'S CONTRIBUTIONS TO AVICULTURE, 1938-1950

NAETHER, C. (1938). Foreign birds at the National Zoo. *Aviculture*. Series III, VIII, 78-79. A collection of various species of *Ducula*, *Treron*, and *Ptilinopus* that arrived with the 1937 National Geographic-sponsored expedition shipment, a pair of Tibetan Snow Pigeons, other pigeons and doves, and Cuban and Clay-coloured Thrushes *Turdus plumbeus rubripes* and *T. grayi* at Washington are described.

(1938). A case of adaptability. *Ibid.* Series III, VIII, 100. Observations on European Starlings feral in Washington D.C.

(1938). A bird refuge in France. *Ibid.* Series III, VII, 150-151. A brief account of a visit to Cleres.

(1938). Correspondence. *Ibid.* Series III, VII, 162. Professor Naether proposes a roster of Society members who breed doves.

(1939). Concerning some rare foreign doves. *Ibid.* Series III, IX, 6-7. A discussion, with a photo, of recently acquired Squatter Pigeons *Petrophassa scripta*, and brief notes on Picazuro and Scaled Pigeons *Columba picazuro* & *C. speciosa*, with a photo of the latter.

(1939). *Calling at European birdshops*. *Ibid.* Series III, IX, 21-24. A general discussion of British, Danish, French and German aviculture and bird-dealing, with detailed descriptions of Chapman's, in London, and Hornung's and Rueckert's, in Berlin.

(1939). On keeping softbills. *Ibid.* Series III, IX, 39-40. A general discussion of husbandry, with notes on Shammas and a Japanese Robin *Erithacus akahige*.

(1939). Birds of the backyard. *Ibid.* Series III, IX, 69-70. Among the Californian birds discussed are White-crowned Sparrows, Cedar Waxwings, Pine Siskins, Black Phoebes, Black-headed Grosbeaks, and Song Sparrows.

(1939). Concerning foreign doves. *Ibid.* Series III, IX, 150-152. A general discussion of avicultural procedures with two photos of Diamond Doves.

(1940). By-pleasures of aviculture. *Ibid.* Series III, X, 4-6. A discussion of the pleasures of avicultural and ornithological literature. Professor Naether mentions in passing that his first foreign doves were Diamonds.

(1940). Some interesting softbills. *Ibid.* Series III, X, 130-134. Species discussed in detail are the Clarino, Mexican Blue Mockingbird, Cuban Solitaire, Cuban Thrush, Spectacled Laughing Thrush, Hooded Oriole, Golden-fronted Leaf Bird, and Chinese Kalandra Lark (depicted in two photographs). An interesting general discussion of certain live foods is included.

(1940). Some wild pigeons from foreign lands. *Ibid.* Series III, X, 171-175. A general discussion is followed by detailed comments on Diamond Doves, Common Bronze-wings (with photo), Squatter Pigeons, Marquesas Ground Dove *Gallicolumba rubescens*, Galapagos Dove, Scaled Pigeon, and Picazuro Pigeon (Also illustrated).

(1940). [Untitled note]. *Ibid.* Series III, X, 178. The positive effects of hot weather on the singing of a Kalandra Lark is noted.

(1940). [Untitled note]. *Ibid.* Series III, X, 185. A note on increased production of a pair of Ruddy Quail Doves.

(1941). A season's nesting of the Ruddy Quail Dove. *Ibid.* Series IV, XI, 13-15.

(1941). Breeding the Cape or Masked Dove. *Ibid.* Series IV, XI, 38.

(1941). Pretre's Tanger. *Ibid.* Series IV, XI, 73. Notes on a recently received pair of the Cuban subspecies of *Spindalis zena*.

(1941). Swans. *Ibid.* Series IV, XI, 85-86. A general discussion with a photo, by the author, of Mute Swans at Castle Helsingor, Denmark.

(1941). On the birdlover's bookshelf. *Ibid.* Series, IV, XI, 117-119. H. S. Williams' *The Private life of birds*, A. E. McIlhenny's *The autobiography of an Egret*, Niedrach & Rockwell's *The birds of Denver and Mountain Parks*, Margaret Morse Nice's now classic work on Song Sparrows, *The watcher at the nest*, the Brookfield Zoo's guidebook and Peterson's *Field Guide to western birds* are enthusiastically reviewed.

(1941). [Untitled note]. *Ibid.* Series IV, XI, 136. Bleeding Heart and Ruddy Quail Doves are observed to be very fond of Thompson seedless grapes.

(1941). Concerning some oriental softbills. *Ibid.* Series IV, XI, 137-141. A Daurian Redstart, a Blue-throat, a Ryukyu Robin and a pair of "Chinese Robin Flycatchers *Poliomyias luteola* (a name not currently in use), were discovered amidst more routinely imported birds in East Asian shipments arriving in Los Angeles. Live food is discussed at length, and photographs of the Daurian Redstart, Blue-throat, Clarino, and Red-legged Honeycreeper are included.

(1941). On the bookshelf. *Ibid.* Series IV, XI, 171. Ruth Wheeler's *We follow the Western Trail* (including accounts of various North American birds), *The Audubon guide to attracting birds*, and the National Geographic Society's *Book of birds* are reviewed.

(1941). Information. *Ibid.* Series IV, XI, 182-183. In answer to a reader's question, Professor Naether presents a diet and husbandry suggestions for "Japanese Tumbler" Titmice.

(1941). Information. *Ibid.* Series IV, XI, 183. In response to a reader's letter, suggestions for breeding Grey Singing Finches are given.

(1942). On the bookshelf. *Ibid.* Series V, XII, 223-225. Detailed reviews of R. S. Palmer's *A behaviour study of the Common Tern*, Jean de Beschere's *Peacocks and other mysteries* and Donald Culross Peattie's *The road of a naturalist* are presented.

(1942). Aviculture in war time. *Ibid.* Series V, XII, 237-238. General advice to persevere.

(1942). Jealousy. *Ibid.* Series V, XII, 265. A note on interactions between nesting Tambourine Doves and Ruddy Quail Doves.

(1942). The Blue-throated Warbler. *Ibid.* Series V, XII, 272. Further notes on the specimen of *Eriothacus svecicus*, mentioned in a previous article, that arrived in an Asian commercial shipment. A photograph of this bird appears on the cover of the following number (4).

(1942). On the bookshelf. *Ibid.* Series V, XII, 279-281. The books reviewed are; L. Lofberg & D. Malcolmson's *Sierra outpost*, R. S. Deck's *Pageant in the sky, a book for the modern sport of bird-watching*, V. S. Eifert's *Birds in your back yard*, V.C. Heilner's *Our American Game Birds*, and E. Parker's *World of birds*.

(1942). On the bookshelf. *Ibid.* Series V, XII, 302-303. A twenty-page illustrated, private printed booklet; *The Chateau de Cleres in Normandy* by Jean Delacour heads a list of reviewed works which also include H. Mitchell's *Raising gamebirds*, H. J. Parham's *A nature lover in British Columbia*, Florence P. Jaques *The Geese fly high* (illustrated by Francis Lee Jaques), and C. St. John's *Canary breeding for beginners*.

(1942). Sequoia Concert. *Ibid.* Series V, XII, 305-306. A celebration of American Robins, at Sequoia National Park, at four in the morning.

(1942). Salute to an Eminent Pioneer in Aviculture. *Ibid.* Series V, XII, 315-323. An appreciation of Frances H. Rudkin's 40 years in the Avicultural Society.

(1942). On the bookshelf. *Ibid.* Series V, XII, 319-321. Phylis Barclay-Smith's *British Birds* and James Fisher's *Watching birds* are at the head of a list that also includes P. A. Tavener's

fieldguides to Canadian Birds (illustrated by Allen Brooks), S. S. Hayden's *The international protection of wild life*, E. W. Teale's *Byways to adventure – A guide to nature hobbies*, Florence P. Jaque's *Birds across the sky*, and the Federal Writer's Project's *Birds of the world*.

(1942). On the bookshelf. *Ibid.* Series V, XII, 339-341. The works reviewed are A. D. Cruickshank's *Birds around New York City – Where and when to find them*, *A forest world*, another fantasy by Felix Salten, the author of *Bambi*, and L. W. Brownell's *Natural History with a camera*.

(1943). Observations on softbills. *Ibid.* XIII, 25-27. General discussions of diet and bathing, with interesting observations on the bathing behaviour of a captive Bewick's Wren *Thryomanes bewickii*.

(1943). On the bookshelf. *Ibid.* XIII, 36. Ernest Thompson Seton's *Trail of an artist-naturalist*, and B. Melville Nicholas' *At home in the woods*, are reviewed.

(1943). On the bookshelf. *Ibid.* XIII, 52-54. Austin Robert's *Birds of South Africa*, C. L. Fenton's *Along nature's highway*, and T. T. Pearson et al.'s *Birds of North Carolina* are reviewed.

(1943). The Blue Jays of California. *Ibid.* XIII, 80-81. Professor Naether is one of a company of distinguished aviculturists voicing objection to a proposal, by Charles Nordhoff (coauthor of *Mutiny on the Bounty*), to destroy California's Jays as pests, on page 17 of this volume.

(1944). On the bookshelf. *Ibid.* XIV, 183-184. The reviewed books are S. A. Graham & D. C. O'Roke's *On your own – How to take care of yourself in wild country*, W. Craig's *The song of the Wood Peewee*, E. W. Teale's *Dune boy*, and E. A. Armstrong's *Bird display*.

(1945). On the bookshelf. *Ibid.* XV, 281-283. Professor Naether reviews L. Dubkin's *The murmur of wings*, T. M. Blackman's *Birds of the Central Pacific Ocean*, Ernst Mayr's *Birds of the Southwest Pacific*, J. A. Knight's *Woodcock*, Joseph Grinnell & Alden Miller's *The distribution of the birds of California*, and Delacour & Mayr's historic *The Family Anatidae*.

(1947). A softbill enthusiast reports. *Ibid.* XVII, 37-39. The songs of a number of different Thrushes and other birds in Professor Naether's aviaries are discussed, as well as behavioural observations. Of particular interest are notes on Blue Mockingbirds and a Cowbird from Chile.

(1947). Birdman's retreat. *Ibid.* XVII, 54-56. A description of the collection of Felix Smolinski, specializing in softbills and finches at his California aviary.

(1947). On the bookshelf. *Ibid.* XVII, 59. Margaret McKenney's *Birds in the garden* is the one work reviewed.

(1948). [Untitled note]. *Ibid.* XVIII, 12. An endorsement of the Swiss animal fancier's weekly *Die Tierwelt*.

(1948). On the bookshelf. *Ibid.* XVIII, 13-15. J. W. Lippincott's *Black wings* (about crows), J. J. Murray's *Wild wings*, A. A. Allen's *Ornithology laboratory notebook* L. de Kiriline's *The Loghouse nest* (about bird-watching in Ontario) and some reproductions of the original Audubon water-colours are reviewed.

(1948). Breeding Crested Quail Doves. *Ibid.* XVIII, 25-26. A photograph of a young bird is included.

(1948). Bird Notes. *Ibid.* XVIII, 34. A number of brief observations on various captive and local wild birds. "Anting" by a Dhyal Thrush, the singing of moulting birds and recent imports to Los Angeles from Thailand are of particular interest.

(1948). On the bookshelf. *Ibid.* XVIII, 53-56. The reviewed works are A. M. Bailey's *Birds of Arctic Alaska*, E. Thane's *The bird who made good*, about a pet Purple Finch, R. M. Saunder's *Flashing wings*, E. J. Sawyer's *Guide to game birds*, the Right Honourable Malcolm MacDonald's *The birds of Brewery Creek* (Canada), P. Jespersen's *The breeding birds of Denmark*, and A. D. Cruickshank's *Wings in the wilderness*.

(1949). The life span of birds in captivity. *Ibid.* XXIV, 1-12. A detailed review with

many very interesting captive longevity records, those from continental European collections being of special interest for English-speaking readers. Passeriformes are covered in detail.

(1950). On the bookshelf [part.]. *Ibid.* XX, 27. Professor Naether reviews C. Barrett's *Australian bird life* and W. Willett's *British birds*.

(1950). On the bookshelf [part.]. *Ibid.* XX, 61. Professor Naether's reviews are of L. Griscom & E. V. Folger's *The birds of Nantucket*, R. Philipson's *Birds of Valley* (on British birds), and I. Brandon's *Where the birds led*, on bird-watching.

(1950). A glimpse of California aviaries. *Ibid.* XX, 66-70. The Northern California collections of Alex Isenberg, Eric Kinsey, and J. W. Steinbeck were recently visited in the company of Ray Thomas, and are described in some detail.

(1950). On the bookshelf. *Ibid.* XX, 92-93. The reviewed books are *A treasury of English wildlife*, edited by W. J. Turner, and L. A. Housman's *Birds of prey of Northeastern North America*.

(1950). On the bookshelf. [part.] *Ibid.* XX, 124-125. T. Petit's *Birds in your back yard*, John Buxton's *The Redstart*, and J. K. Stanford's *The Awl-birds* (on the return of Avocets to England) are the subjects of this final series of *Aviculture* reviews.

#### PROFESSOR NAETHER'S CONTRIBUTIONS TO THE AVICULTURAL MAGAZINE 1951-1988

NAETHER, C. (1951). Some notes on caring for the smaller softbills. *Avicultural Magazine*. LVII, 50-53. Among the more interesting of the many species in this discussion of various avicultural procedures are the East Asian Blue Flycatcher, Bewick's and Canyon Wrens, the Japanese Bush Warbler, and unspecified Manakins.

(1951). Reviews [part.]. *Ibid.* LVII, 72-73. The reviewed book is *Lifelong boyhood: Recollections of a naturalist afield*, by Loye Miller, of the University of California's Museum of Vertebrate Zoology. This book includes many accounts of North American birds and bird fossils.

(1951). Sequoia symphony. *Ibid.* LVII, 103-104. This is the same article published in *Aviculture* in 1942.

(1951). Reviews [part.]. *Ibid.* LVII, 150-151. *The Audubon book of bird carving*, a manual for making wooden models, is reviewed.

(1952). Reviews [part.]. *Ibid.* LVIII, 40-42. The books are A. H. Chisholm's *Bird wonders of Australia*, and G. M. Sutton's *Mexican birds*.

(1952). Reviews. *Ibid.* LVIII, 80-81. O. S. Pettingill's *A guide to bird finding east of the Mississippi*, and H. Frieling's *Was fliegt denn da* (A field guide to Central European Birds) are reviewed.

(1952). Reviews [part.]. *Ibid.* LVIII, 116. A recommendation of A. A. Allen's *Stalking birds with colour camera*, published by the National Geographic Society.

(1952). My first Canyon Wren. *Ibid.* LVIII, 132-133. This bird was collected in California by Felix Smolinski.

(1953). Reviews [part.]. *Ibid.* LIX, 148-150. Professor Naether reviews E. R. Blake's *Birds of Mexico*, Bernard Poe's *The care and training of cage birds*, and H. W. Hann's *The biology of birds*.

(1953). Reviews [part.]. *Ibid.* LIX, 221. *Die Gefiederten: Das schoene leben der voegel*, a general discussion of birds, is enthusiastically endorsed.

(1954). Reviews. *Ibid.* LX, 37-39. Professor Naether's final review for the *Avicultural magazine* concerns Delacour's *Pheasant breeding and care*, R. Heyder's *Die Vogel des Landes Sachsen* (The birds of Saxony), and *Parrots exclusively* by Karl Plath, C. Feyerabend, and I. E. Altman (with illustrations by Karl Plath.)

(1954). Mr Rudkin, Sr. carries on at 92! *Ibid.* LX, 68-69. A tribute to Francis H. Rudkin, then making "active plans for the 1954 breeding season".

(1954). Some reflections of a softbill enthusiast. *Ibid.* LX, 214-222. A twenty year retrospective. Birds discussed in detail are Shamas, Clarinos, and the Japanese Bush Warbler. Softbill diets are discussed at length.

(1959). Breeding Galapagos and other Doves in California. *Ibid.* LXV, 135-136. The "other doves" discussed in detail are in the possession of Mel Strann: Olive Pigeons are "Chilean Eared or Ground Doves". Professor Naether's new Splendid Pigeons *Columba speciosa* are briefly mentioned.

(1960). A California aviary. *Ibid.* LXVI, 95-96. This complex of ten cages was built a year-and-a-half previously, and houses both pigeons and softbills. The more notable inhabitants include Mountain Witch, Splendid (Scaley-naped) Pigeon, Bartlett's and Luzon Bleeding-hearts, Yuhinas, Bluethroats, Rubythroats, Whitethroats, and unspecified Redstarts and Bluebirds.

(1961). Nesting of the splendid Pigeon. *Columba speciosa*. *Ibid.* LXVII, 136-138.

(1961). Insect food (Correspondence). *Ibid.* LXVII, 143-144. A "Seedmoth" harvested from the floors of finch aviaries is recommended.

(1961). Further data relating to the breeding behaviour of the Splendid Pigeon *Columba speciosa*. *Ibid.* LXVII, 165.

(1962). Some random observations of the behaviour of wild pigeons and doves in captivity. *Ibid.* LXVIII, 93-95. Observations on the preference of certain species for egg-yolk and cheese, polygamy in Splendid Pigeons and Bartailed Cuckoo Doves, flight distance of alarmed captive doves.

(1962). Sidelights on the nesting behaviour of the Key West Quail Dove. *Ibid.* LXVIII, 136-139.

(1962). A nesting of the Key West Quail Dove: Third report. *Ibid.* LXVIII, 170-172.

(1963). A close-up view of the Mountain Witch Dove. *Ibid.* LXIV, 201-205.

(1963). Breeding Bartlett's Bleeding-heart Pigeon *Gallicolumba criniger*. *Ibid.* LXIV, 217-222. A review of this species captive history is included, as well as comparative photos of Bartlett's and Luzon Bleeding-hearts.

(1965). A seldom-seen hybrid. *Ibid.* LXXI, 13-15. A report on a hybrid between the Snow Pigeon *Columba leuconata* and the similarly patterned domestic Strasser, with accompanying notes by Derek Goodwin.

(1965). Using foster-parents to raise foreign doves. *Ibid.* LXXI, 152-153. The species discussed are the Australian Plumed (Spinifex) Pigeon, which had, to that point, only been artificially raised in the U.S., the Bartlett's Bleeding-heart, which was not successfully reared by Barbary Doves, the Key-West Quail Dove, which was, and Crowned Pigeons, which did not survive under Homing Pigeons. There are extracts from a letter from K. C. Lint, of the San Diego Zoo, on the impossibility of hand-rearing Crowned Pigeons.

(1965). Further observations of the mating behaviour of Snow Pigeon X Strasser male. *Ibid.* LXXI, 174-175. Two photographs of this bird, which displays none of the distinctive patterns of either parent, are included. This hybrid was mated to a White Racing Homer, producing two White off-spring that died at nine and ten days. Also included, without textual reference are photographs of two Barbary Dove X Vienna Tumbler crosses.

(1966). What price "togetherness"? *Ibid.* LXXII, 51-53. An account of an unsuccessful attempt to breed Plumed (Spinifex) Doves.

(1966). Enjoying a diversified congregation of softbills. *Ibid.* LXXII, 73-75. 25 birds mostly single specimens, are maintained in an aviary 8' x 8' x 16'. Roughly a dozen species are named, some described in detail. Among the more notable specimens are *Yuhina flavicollis* and *Y. nigrimenta*, both in the collection for seven years, a White-capped Redstart *Chaimarrornis leucocephalus*, a "Yellow-legged Blackbird from South America," and "a number of Japanese Brown Titmice".

(1966). Some final observations on the mating behaviour of Snow Pigeon X Blue, Barless Strasser, male. *Ibid.* LXXII, 133. The previously discussed hybrid offspring was mated to a female Blue, Barless Strasser, producing a number of squabs, only one of which fledged. Photos of this surviving bird and its parents are included. A number of behavioural observations are provided.

(1966). Some comments on Derek Goodwin's article "Keeping doves and pigeons: Some suggestions." *Ibid.* LXXII, 179-180. The value of popcorn, altering fruit pigeon's diets, and the advisability of solid aviary roofs are discussed.

(1967). Moulting and plumage in captive seed-eating foreign doves. *Ibid.* LXXIII, 33-35. Professor Naether finds no evidence of seasonal moulting in his California aviary. Bartlett's Bleeding-hearts are the species specifically discussed.

(1967). Feeding Fruit Pigeons. *Ibid.* LXXIII, 47-48. As a result of an increase in availability of Fruit Pigeons in California in 1966, Professor Naether devised a mixture of fruit and chicken pellets to produce firmer droppings. No species are mentioned specifically.

(1968). The role of sentiment in aviculture. *Ibid.* LXXIV, 50-51. An essay on aviculture "for the joy of it".

(1968). Observations of a full year's breeding behaviour of a pair of Key-West Quail Doves *Geotrygon chrysis*. *Ibid.* LXXIV, 59-61.

(1968). The Western White-winged Dove *Melopelia asiatica mearnsi*, in light of its natural background *Ibid.* LXXIV, 131-133.

(1968). Wanted: A green pigeon! *Ibid.* LXXIV, 146-147. A (sceptical) request for any information on possible hybrids between domestic pigeons and Fruit Pigeons or Green-winged Doves, or the feasibility of producing such through artificial insemination, made on behalf of wishful pigeon-fancying acquaintances.

(1969). Understanding birds in captivity. *Ibid.* LXXV, 27-31. A discussion of methods of "kind and thoughtful treatment of captive birds". Three pet Shamas are discussed at length, and an aviary 6' x 6' x 10', housing Blue-winged Sivas, Yuhinas, Bananaquits, Tanagers, etc, is mentioned.

(1971). Cuckoo Doves adjust quickly to aviary confinement. *Ibid.* LXXVII, 69-70. A general discussion, with mention of a breeding pair of unspecified species.

(1971). Encounters with the Western Mourning Dove. *Ibid.* LXXVII, 169-171. Observations, over many years, of wild birds. Hybridization with Barbary Doves is briefly discussed. Two photos of wild nestlings and one of a captive white specimen (with out text comment) are included.

(1973). Observing the habits of foreign doves in captivity. *Ibid.* LXXIX, 44-46. The species discussed are Galapagos Doves, Snow Pigeons, Splendid (Scaley-naped) Pigeons, Bartlett's Cuckoo Doves, Key West Quail Doves, and Bartlett's Bleeding-hearts, with varying behavioural observations for each.

(1974). The Key West Quail Dove. *Geotrygon chrysis*. *Ibid.* LXXX, 45-46. A detailed discussion of the Professor's twelve-year-old breeding pair, with a photo of these birds.

(1974). News and views (Part). *Ibid.* LXXX, 77. Professor Naether writes regarding the formation of the American Dove Association, and recent importations of large numbers of Bartlett's Bleeding-hearts and Crowned Pigeons to California, with current prices.

(1975). The Band-tailed Pigeon *Columba fasciata*. *Ibid.* LXXXI, 81-84.

(1975). The White-collared Pigeon. *Columba albitorques*. *Ibid.* LXXXI, 228-229. A general discussion of this species' natural history. Professor Naether knows of no current captive specimens, but mentions ones that Delacour and Ghigi maintained in the past.

(1975). News and views (part). *Ibid.* LXXXI, 231-232. A brief description of the pigeon and dove collection of Guy Hughes, near Los Angeles.

(1976). Raising of Bleeding Heart Doves. *Ibid.* LXXXII, 163-164. Luzon Bleeding-

hearts were successfully fostered under Barbary Doves.

(1977). Sidelights on the lifestyle of the American Goldfinch. *Ibid.* LXXXIII, 193-194. A general discussion of natural history in the wild.

(1980). Important news concerning Rock Pigeons. *Ibid.* LXXXVVI, 176-178. Professor Naether presents extracts from a series of articles on Rock Pigeon subspecies that appeared in *Geflugel-Borse*, a West German fancier's magazine.

(1981). Snow Pigeons breeding at 10,000 feet altitude. *Ibid.* LXXXVII, 51-53. A retrospective of Professor Naether's captive experience with this species.

(1981). Correspondence. *Ibid.* LXXXVII, 123. Professor Naether answers some questions Derek Goodwin had regarding the extracts from *Geflugel-Borse*. He provides an instance of reversion to type in feral pigeons in San Diego and discusses hybridization between free-flying African Spotted Pigeons and Rock Pigeons at the Rudkin Aviaries.

(1988). Jean Delacour: Famous aviculturist and author. A personal tribute. *Ibid.* XZIV, 66-67.

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## A REVIEW OF THE 1990 AVIAN BREEDING SUCCESSES OF A MIXED SPECIES RAIN FOREST EXHIBIT

Rosemary J. Krussman

(Aviculturist, National Aquarium in Baltimore)

The rain forest exhibit in the National Aquarium in Baltimore occupies 519,060 cubic feet and houses 16 species of birds with a total of 40 specimens in a free flight situation. (Table 1). Other inhabitants of this exhibit are six reptile species including Iguanas and Basilisk lizards, 11 amphibian species including Tree Frogs and Poison Dart Frogs, and one mammal species, the Two-Toed Sloth *Choloepus hoffmani*. In it grow over 600 species of tropical plants.

Avian breeding successes for the year included the Scarlet Ibis *Eudocimus ruber*, Hawk-headed Parrot *Deroytyus accipitrinus*, Green Aracari *Pteroglossus viridis*, Red-capped Cardinal *Paroaria gularis*, and the Silver-beaked Tanager *Ramphocelus carbo*. This paper describes the husbandry and breeding of these species.

### *Scarlet Ibis*

After arriving at the aquarium in 1984 from West Germany, our two ibis pairs bred with limited success in 1986 and 1987. However, in 1990 they produced more chicks (seven) than in all of their previous years combined. We attribute this to several husbandry changes. One of the important modifications made during this time was to the contents of the birds' diet. Previously, the ibis diet consisted of two cups of soaked dog chow, three quarters of a cup of Caradee, one eighth of a teaspoonful of Quintrex Redaxanthin (Nutritional Research Assoc. Inc.), a feather dye, one tablespoonful of Vionate vitamins (Rich Health Inc.), one half cup of silverside fish *Marinus marinus*, one cup of krill *Euphasia superba* and two cups of chopped chicken livers. In the winter of 1989, we changed the diet by adding two cups of Flamingo Diet (Zeigler Bros., Inc.) and omitting the chicken livers and the Redaxanthin red, which is an additive to the flamingo diet. In addition to this diet, the birds have been observed feeding on softbill food (Table 2) and on live insects including mealworms, waxworms, and crickets available from morning and afternoon "bug drops". The birds have also been seen feeding on Dusky Tree Frogs *Smilisca phaeota*.

Another difference was in the selection of the nesting site. In previous years the birds made use of large man-made wire nesting platforms which had been provided for them in a corner of the forest.

A problem with these sites was that the Sloths frequently used them as resting places thus interfering with the birds ability to utilise them for nesting. This year nest building took place on our "epiphyte tree", a large artificial tree heavily planted with bromeliads, orchids, aroids, etc. Nest construction began after clearing sites of epiphytic plants (much to the dismay of our horticulturist). Nesting material consisted of stripped ficus branches and twigs which we had provided for them on the forest floor.

TABLE 1

## Rain Forest Aviculture Species Composition 1990

<i>Common Name</i>	<i>Scientific Name</i>
Scarlet Ibis	<i>Eudocimus ruber</i>
Ringed Teal	<i>Anas leucophrys</i>
Grey-necked Wood Rail	<i>Aramides cajaena</i>
Sun Bittern	<i>Eurypyga helias</i>
Pale-vented Pigeon	<i>Columba cayennensis</i>
Yellow-crowned Amazon	<i>Amazona ochocephala</i>
Sun Conure	<i>Aratinga solstitialis</i>
Hawk-headed Parrot	<i>Derophtus accipitrinus</i>
Blue-crowned Motmot	<i>Momotus momota</i>
Black-spotted Barbet	<i>Capito niger</i>
Green Aracari	<i>Pteroglossus viridis</i>
Red-capped Cardinal	<i>Paroaria gularis</i>
Yellow Grosbeak	<i>Pheucticus chrysopelus</i>
Silver-beaked Tanager	<i>Ramphocelus carbo</i>
Blue-grey Tanager	<i>Thraupis episcopus</i>
Yellow-hooded Blackbird	<i>Agelaius icterocephalus</i>

Both pairs of ibis nested side by side on one branch with one large bromeliad *Aechmea sp.* separating the two nests. These nests were constructed in early May. By mid-May, both nests were observed to have eggs in them and both sexes were doing their share of the incubating. Our first hatching occurred on 26th May with the second and third occurring on 1st June. The parents reared their young with no interference from the staff. By late June, the chicks began venturing onto other branches of the tree and were fully fledged in early July. By late July, the parents had begun building new nests on another branch of the same tree and again they were side by side with one epiphyte between them. On 1st August eggs were apparent in both nests. Hatchings occurred on 18th, 19th, 21st and 22nd August. The chicks were again parent reared with little interference. When the staff banded the second set of chicks in mid-September they began to fledge early by leaving the nest branch and going into

adjacent areas. The parents continued to feed the chicks away from the nesting site. Our average incubation time was found to be 21 days with fledging occurring at approximately 49 days.

The first clutch of chicks was permitted to stay in the forest until mid-October, during which time no signs of conflict were noticed between the two sets of chicks or their parents. Unfortunately, some plant damage did occur due to the intense foraging activity of the chicks. Unlike the adults, the chicks were seen prodding and sometimes uprooting epiphytic plants throughout the forest, possibly looking for insects and tree frogs. The first clutch was transferred to the service area to await shipment to another institution. The second clutch remained in the forest until mid-November when they too were placed in the service area for shipping preparation. Soon afterwards the parents began their winter moult.

TABLE 2

## Softbill Diet Contents

*Dry contents*

2½ cups Flight Conditioner	1½ cups Layena
¾ cup Mockingbird Chow	2 tbsp Vionate vitamins
¾ cup Trout Chow	1 tbsp Linatone oil
½ cup Grit/Oyster shell	

*Wet contents*

A food processor is used to chop:

1 cup Carrots	4 Hard-boiled eggs
½ bag Spinach	¼ head Romain lettuce
3 Apples	3 Pears
1½ cups Grapes	1½ Tomatoes
2 Bananas	1 Orange
1 cup Raisins	1 cup Peas
1 cup Corn	

The ingredients are thoroughly mixed in a large bowl and dispensed into 12 large bowls.

The bowls will each contain 1 cup of this mixture and 1 cup of a dry "Rain Forest Grain Mix":

1 part Flight Conditioner	2 parts Pigeon seed
1 part Purina cat chow	1 part Dog chow
1 part Trout chow	2 parts Cracked Corn
2 parts Mixed Finch seed	1 part Parrot seed
1 part Layena	

*Hawk-Headed Parrot*

Our adult male Hawk Head was paired with an adult female in the

autumn of 1989. Both birds were wild caught. The pair agreed well but no breeding behaviour was noticed. They were fed a diet consisting of a parrot seed mix supplemented with fresh fruits and vegetables, and Nekton-S vitamins (Nekton U.S.A., Inc.). The birds were placed in the rain forest exhibit in March 1990. At this time they had access to parrot and softbill diets. By the end of March, they were observed entering nest boxes resembling the ones to which they had access in the service area. These boxes measure 13" × 11" × 26" and were placed about 25 feet above the floor of the exhibit. Frequent copulation was observed during the following two months. In early May, three eggs were found in one of the nest boxes. On 16th May, one of the eggs had hatched. Periodic checks were made on the chick for the next two months. The adults began spending more and more time outside the nest box towards the end of June but there was no sign of a fledging chick. The nest box was examined again on 10th July and the chick was found to be half the size of the adults. Since we had been informed that the normal time to fledging was close to two months, we began to wonder why we had not seen the chick peering out of the box. Perches and extra nesting material were placed within the box in the hope that they might aid the chick in fledging. When this did not occur by 8th August we checked the box again to discover the parents had laid two new eggs next to the chick. We removed the chick from the box and brought it into the service area where it was discovered to have a deformity of the legs.

A third egg was laid but the parents abandoned the nest box soon afterwards. The eggs were removed and candled and were found to have no signs of development. In mid-September the parrots began working on a palm log that had been placed nearly 20 feet above the walkways on the side of the forest opposite from their original nesting site. During the period of 23rd September to 17th October the parrots were observed copulating. The female was seen entering a palm log which had been previously hollowed by Black Spotted Barbets *Capito niger*. Both parrots continued working on the log creating a cavity with a depth of approximately four feet from the top and giving it two entrance holes on the side. The male would stand guard on the top. On 30th October we had not seen the female for two days and the male was continuing his duty as guard from the top of the log. On the 31st the log was checked to find three eggs.

On 13th November both parrots were seen outside the log consuming a large amount of food including palm fronds which they chewed frequently. The types of palms used included Madagascar

TABLE 3

## Sloth Diet Contents

1/8 head Romain Lettuce	1/2 Tomato
1/4 bag Spinach	1/8 head Cabbage
1/4 Apple	1/4 Pear
1/4 Orange	1/2 cup Peas
1/4 cup Broccoli	1/2 Carrot
1/2 Sweet Potato	1/2 cup Red Grapes
1/2 Red Potato	1/2 Turnip
1/2 Beet	small handful of string beans
3/4 cup Meat mix	1 tbsp Sloth Vitamin Mix
<i>Meat Mix</i>	
1/2 can moist dog food	1/2 cup soaked cat chow
1/8 cup Molasses	1/8 cup Linatone oil (Lambert Kay)
1 Hard Boiled Egg	1/4 cup Monkey Chow Dust (Purina)
<i>Sloth Vitamin Mix</i>	
1/2 cup Vionate Vitamins (Rich Health, Inc.)	
1 Bottle (60 tablets) Calcium	
1/4 cup Monkey Chow Dust	
1/2 cup Vitamin E powder	

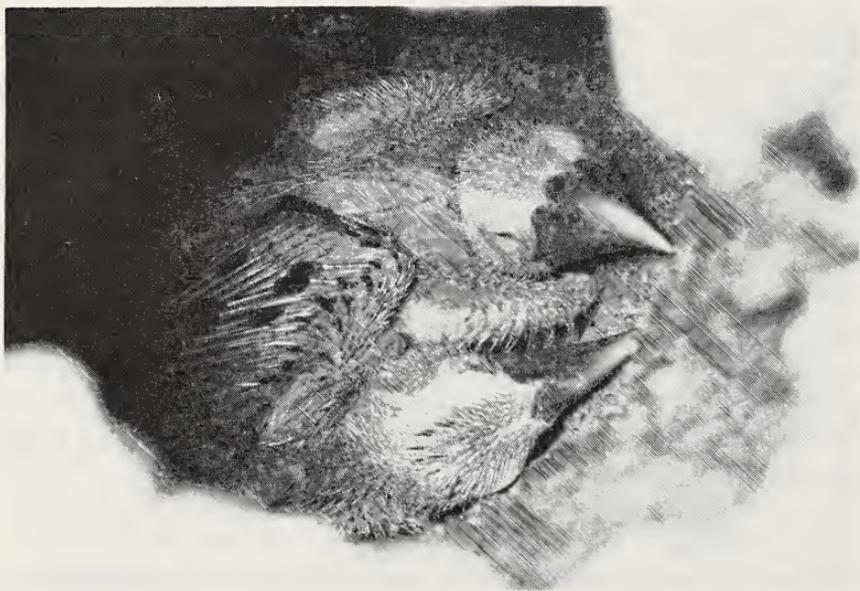
Butterfly Palm *Chrysalidocarpus lutescens*, Chinese Fan Palm *Livistona chinensis*, Coconut Palm *Cocos nucifera*, Lady Palm *Rhapis exelsa*, and two palms of the *Geonoma* and *Chamaedorea* genera. The birds were also observed eating much of the sloth diet (Table 3) which is placed in the forest in the late afternoon. The log was checked at this time to find three newly hatched chicks. Subsequent examination confirmed that the chicks were developing normally without any problems or deformities. They were examined every two weeks until 26th December when they were found to be fully feathered and ready to fledge. The chicks began peering out of the log on 31st December and all had successfully fledged by 15th January, 1991. We found our average incubation time to be 16 days with fledging occurring after two months.

*Green Aracaris*

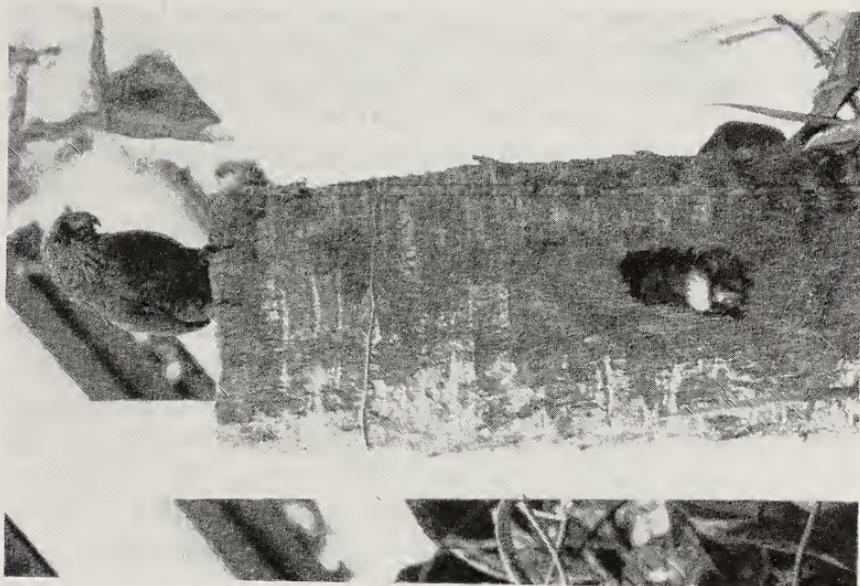
A pair of Green Aracaris have been housed by the NAIB since September of 1987. Both of the birds were wild caught and estimated to be about four years old. In February 1990, soon after palm logs had been placed in the forest, the Aracaris were seen performing their first nest building activities. The log was excavated from its top and the birds burrowing down approximately two feet to a widened



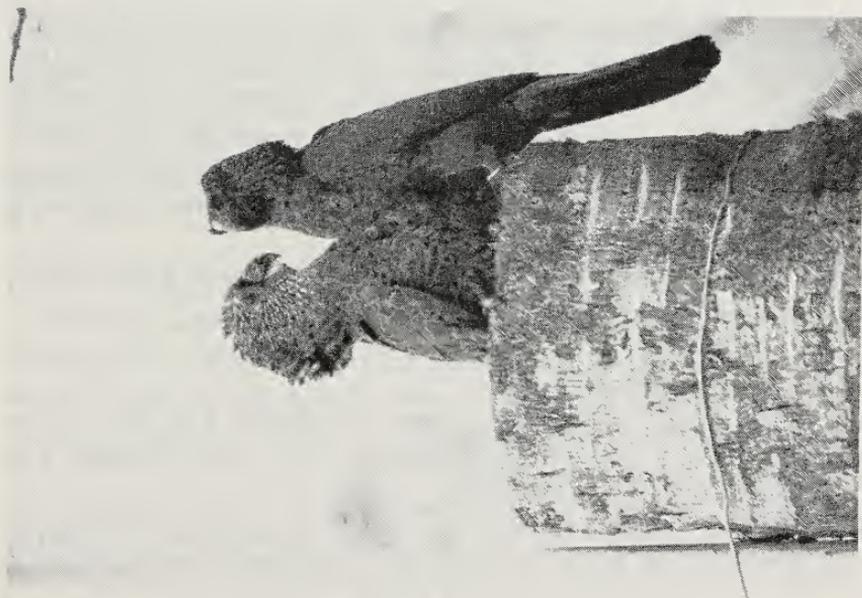
Scarlet ibis (*Eudocimus suber*)  
Nesting site on "epiphyte tree".



Green Aracaris (*Pteroglossus viridis*)  
Chicks developing within nesting log.



Hawkheaded Parrot (*Derophtyus accipitrinus*)  
Parent (top) Chick (peering from log)



Hawkheaded Parrot (*Derophtyus accipitrinus*)  
Parent (right) Chick (left).

bottom. No nesting materials were added to the log. An increased amount of mutual feeding occurred and copulation was observed first on 27th February and again on 1st March. On 9th April, two eggs were found on the bottom of the log. On 24th April our first hatching occurred. The parents increased their insect intake during the morning and afternoon “bug drops”. They also had access to softbill and parrot diets. The birds seemed to prefer the whole fruits such as blueberries and grapes as well as the dog kibble and were seen carrying these items to the chicks. Our horticulturist noticed that the birds also used a number of the plant species within the forest as a food source. These included the leaves of the Autograph tree *Clusia rosea*, the leaves of the Night Blooming Cactus *Epiphyllum oxypetalum*, the leaves of the Weeping Fig *Ficus benjamina*, the seeds of a bromeliad *Aechmea bracteata*, and the berries of *Anthurium gracile*. After 41 days of development within the log the chick fledged. The male was the primary feeder of the chick once it had fledged and within days it was seen eating on it's own. Four days after the chick fledged the parents were seen copulating. On 22nd June three eggs were found within their original nesting log.

On 7th July two of the eggs had hatched. The chicks continued to grow over the next month and on 10th August they were seen peeking out of the log. The chick from the first clutch was removed from the forest on 14th August and sent to another institution. The other two chicks fledged the next day. These chicks were permitted to stay within the forest with their parents for the following two months. In late October they were removed for physical examination. The parents once again began feeding each other, spending more time in and around the nest log and copulation was observed late in December. In January 1991, three more eggs were found in the log.

From these breedings we have found the incubation time to be 15 days with fledging occurring at 41 and 35 days.

### *Red-Capped Cardinal*

A pair of wild caught Red-capped Cardinals was received in September 1989. After being quarantined, they were released into the forest on 12th December 1989.

The birds were seen working on a nest in one of the Weeping Fig trees *F. benjamina* as early as 7th January. Nesting materials included palm fibre, coconut fibre, and soft string. The nest itself was small (5 inches in diameter), cup shaped and usually found nestled between branches.

Unlike the birds previously mentioned, the cardinals face a greater threat of predation, nest destruction, and egg stealing by more aggressive species. On a number of occasions, the Green Aracaris have been seen actively destroying nests and have been suspected of robbing them of their eggs. Therefore, much of the bird's time is spent constructing and moving the nest as necessary due to exhibit stressors.

Eggs were found in the first nest on 15th January. The female incubated for several weeks and on 9th February laid two more eggs. On 18th February, the four eggs were candled. We found the first two eggs infertile and the second pair fertile. The fertile eggs were replaced in the nest and they hatched four days later on 21st February.

The birds became quite bold during our bug drops while they were raising chicks. The young were fed almost exclusively on insects for the first week. We allowed the parents to raise the chicks to fledgling size which takes about 15 days. At this time the nest of chicks was moved to a small cage within the forest and one or both of the parents were trapped inside with the chicks where they continued to raise them without the interference of other species. This also allowed for an easy removal of juvenile birds from our exhibit.

We did encounter health problems with the use of synthetic fibres as a nesting material. One chick suffered swelling in its mouth, which was found to be caused by nylon string fibres wrapped around the tongue. Once removed, the chick recovered and only natural fibres were subsequently used in the forest.

This year the cardinals have successfully raised four separate clutches making a total of seven young. The average incubation time is 12 days.

### *Silver-beaked Tanager*

For some time, the Silver-beaked Tanagers have been reproducing successfully. This prolific pair has reared many clutches since its arrival at the NAIB in early 1988. The habits of the Silver-beak are almost the same as those of the Red-capped Cardinal with the diet and environmental pressures being identical. Therefore, the husbandry techniques for these birds are similar. This year they produced five clutches for a total of four chicks. We found the incubation time to be nearly 11 days with fledging occurring on the 12th day. Because of the difficulty in placing this species in other institutions, they were not encouraged particularly to breed. As chicks were successfully reared, they became excess surplus stock in

our service area. The staff was not anxious to continue to breed these tanagers and attempts were made to try and prevent some hatchings. Techniques to limit the number of hatchings such as "egg shaking" and water injection into the eggs were performed which explains the small number of chicks produced during the year.

### *Summary*

The year 1990 was successful for the aviculture section of the National Aquarium in Baltimore. We can attribute these successes to a number of factors such as dietary improvements and the provision of suitable nesting materials. One other recent (July 1989) modification has been the addition of a fogging system (Mee Industries). This system delivers a fine water mist to the forest on a timed schedule in order to maintain the humidity of the forest at a level of 80%. At times, the humidity level is pushed to 95% and thus produces the effect of a tropical rain forest engulfed in cloud cover. A number of species of birds have been observed stationed near the misting nozzles using them to bathe and as a drinking water source.

Our continued efforts to recreate a natural environment for our collection have paid off this year with the breeding of five interesting species.

### ACKNOWLEDGEMENT

I should like to express my thanks to the rain forest staff of the NAIB and to Carey Rowsom, aviculturist, and Steve Turner, horticulturist, for their help and extensive observations.

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## BREEDING THE BUFFONS TOURACO

By: S. C. Horne  
(Irthlingborough)

The Buffons Touraco *Tauraco persa buffoni* is approximately 16 inches in length. The sexes are alike. The head, crest, mantle and breast are green. The crest is full and rounded and of hair-like texture.

In front of the eye there is a triangular white patch under which a thick black line runs backwards. Below this is a very thin white line, only visible at very close quarters. The back, rump, tail, wing coverts and secondaries are glossy violet-purple. The primaries are carmine with their outer edges and tips black. The iris is brown, the orbital ring scarlet, the beak brown and the legs and feet are black.

Buffons Touraco is found in West Africa. It is a sub-species of the Green-crested Touraco *Tauraco persa persa* which differs from it in having a thin black line under the eye with a broad white stripe beneath extending backwards almost to the nape, and its crest tinted pink at the tip.

I obtained two unsexed Buffons Touracos in October 1988. They were sold to me as Green-crested Touracos. They had been kept in an outside aviary for some time and were fully acclimatised. The birds were placed in a 10ft long × 6ft wide × 6ft 6in high outdoor flight which was attached to a shed in which they had access to a roomy flight cage. The shed is kept at a minimum temperature of 55°F and artificially lit to give the birds at least twelve to thirteen hours of light during the winter months. The touracos were fed on a variety of fresh chopped fruits, mainly apple, pear, grapes and bananas plus others in season. They were also given Phebo dog food soaked in water overnight, chopped and mixed with Bogena insectivorous food and Vionate multivitamin powder.

The birds soon settled down and were often seen feeding each other. They were surgically sexed in April 1989 and proved to be two hens. While I was trying to find a cock bird during the next couple of months it was brought to my attention that I had Buffons Touracos and not Green-crested. Apparently, during the previous couple of years, several other people had been sold Buffons Touracos which they believed to be Green-crested.

An odd Buffon's cock was obtained during the early part of July. It was placed in an enclosure running alongside the aviary containing the two hens which had been ringed for easy identification. Within

two weeks the cock was seen on several occasions feeding one of the hens through the wire and showing signs of aggression towards the other which was found a suitable mate in another aviary. During the next six months several attempts were made to get the two birds together but on every occasion the cock became very aggressive towards the hen, chasing her relentlessly within a couple of hours of their being put together. However, he would still feed her regularly through the wire.

At the end of April 1990 the cock was allowed into the hen's aviary early one morning. He immediately tried to feed her. They were together all day with no problems. From then on both birds roosted in the flight, usually in an elderberry bush. No aggressive behaviour was observed between the birds from then on, although they both showed aggression to a pair of Livingstones Touracos in an adjoining flight.

Two eggs were found in a hanging basket suspended in an elderberry bush, on 4th June when both birds commenced incubating them in turn. Two chicks were seen in the nest on 28th June. On 5th July a chick was found dead on the floor beneath the nest. It was covered with thick brown down, not black, as with the young of White-cheeked and Livingstone's Touracos. The other chick seemed fine, strong and very alert sitting in the nest. It was seen on a perch near the nest on 19th July and running around the floor on 20th July. It still looked brown in colour. On 24th July the cock again began to show signs of aggression towards the hen.

The chick was becoming very active and was beginning to show colour and on 2nd August it was seen perching in the inside flight of the shed. On 5th September the baby was taken away from its parents because the cock was still aggressive towards the hen. It had been feeding itself and this seemed an opportune time to segregate it for its own safety. The adult pair were separated on 20th September because they were fighting but the cock continued to feed the hen through the wire daily. At the time of writing (31st October) the chick is doing well and is showing a lot of colour.

**BREEDING OF DUIVENBODE'S LORY**  
***CHALCOPSITTA DUIVENBODEI DUIVENBODEI***

By: K. W. Dolton  
(Worcester)

The Duivenbode's Lory, which comes from North West New Guinea was, according to Rosemary Low, first imported in 1929 but not again until 1973. Between then and 1988 many pairs were brought into the country. I purchased a female from Birdland, Bourton-on-Water in 1985 and this was a hand-reared bird. The male was an imported bird which I obtained in 1987. This pair of birds laid one infertile egg in 1989. During the cleaning out of the nest-boxes in my Lory collection early in September 1990 I found a fully grown young Duivenbode's Lory which the parents were rearing. The young bird continued to be fed by the parents, left the nest-box during the last week of September and is now fully independent.

The parent birds, together with the young, were fed nectar, made up with Vitafood, honey, sugar, Milupa, Bovril and mixed with hot water. These and all my Lory collection are fed also with carrots, apples, pulses and soaked sunflower seeds which are pushed through the wire of the outside flight cage on to a feeding tray. I find that by giving them soaked sunflower seeds they do not get the fungus *Candida albicans* in their mouths. I realise that many Duivenbode's Lory have been bred by aviculturists in this country but they have all been hand-reared. I feel therefore that this is a first breeding and our Chairman Professor Hodges saw the bird in the nest when he called on me and can confirm that it was being parent-reared.

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## BREEDING BLUE CROWNED MOTMOTS AT KILVERSTONE WILDLIFE PARK

By: P. F. Larcombe

The Blue Crowned Motmot *Momotus momata* is one of the nine species which make up this American family. It is the largest species and the one most commonly seen in captivity. It ranges widely throughout South and Central America from Argentina to Mexico. Twenty-one races are represented in this wide distribution. The sexes are similar. The birds are green to olive brown above and olive green to dull cinnamon below. The tail is greenish blue with blue spatulae. The crown, which is surrounded by a broad blue band, and the sides of the head are black.

We received our Blue Crowned Motmots in August 1981. There were three birds of unknown sex, which we found later to be two cocks and a hen. They were released into our Semi-Tropical House, where they soon settled down well. This house measures 54ft long by 20ft wide, and has a public footpath along the front. It is well planted throughout and is provided with a small waterfall and stream leading to a larger pool. The birds soon became fairly tame and would come to bathe under the hosepipe. I have never seen them bathe in any other way. Their diet was a problem at first as they would take only mealworms. Mice, crickets and locusts were eaten but were not readily available at the time. A mixture of chopped fruits, raisins, mincemeat and insectivorous food was offered and gradually the birds began to take some. However, mealworms still made up the major part of their diet which consists now of mincemeat, soaked raisins, grapes, bananas, mealworms, whitebait and earthworms. Other insects and mice are eaten occasionally.

It was not until 1984 that any signs of breeding behaviour occurred when the third bird was attacked by the other two. It was removed before it came to any harm. The other two kept very close and could be heard calling frequently. Signs of nesting appeared on the aviary floor in the form of a large crater, which had been excavated by the birds, into one side of which a hole had been dug upwards. The birds were allowed to carry on for the rest of that season, but nothing came of this attempt to breed. During the winter we built a bank into which they could burrow and we also inspected the burrow made previously. It was 11 feet long and very close to the surface. It wound from side to side and backwards, crossing over itself several times above and below, before terminating in a small chamber.

We hoped that the birds would breed successfully in 1985 with the new bank in place. It measured 6 feet long by 4 feet wide by 5 feet high. It was not long before they had burrowed straight into the bank about halfway up. This was as far as they got for they transferred their attention to the floor at the far end of the house. These excavations were not acceptable to us particularly when the birds started digging under the Pygmy Marmoset *Cebuelle pygmaea* enclosure for this burrow had to be filled in almost daily. Then in late March they started back at the base of the bank. They made a large crater in the floor with a burrow leading upwards and into the bank. It was impossible to see the entrance without getting on hands and knees and looking up under the rim. The birds spent six weeks or more burrowing, not only in the bank but also at several sites in the greenhouse. Around mid-May one bird could not be seen and burrowing seemed to have ceased everywhere. The other bird was usually perched close to and above the bank. The missing bird was not seen for days and I wondered whether it was dead, sitting or laying. One morning it re-appeared but the other was missing, so both birds share incubation. I do not know how long the incubation period is. Reference books give 17 or 21 days but without my knowing when incubation started it is impossible to say which is correct. I started giving them as many insects as we could collect on the 17th day after the first bird disappeared. Several days later one bird was seen entering the burrow with a mealworm. Both birds are very cautious about entering the burrow when feeding. Later both birds were seen out and feeding started in earnest mainly on mealworms although other foods were offered. A week later one adult was seen carrying a dead chick, which looked about ten days old. Feeding continued and on 14th July two young fledged. Both were identical to the adults but they lacked the tail racquets. The adults continued to feed the young for some time after fledging. It was during this period that I noticed the adults drop to the floor and catch earthworms. These, after being beaten on a branch, were fed to the young. This prompted me to offer worms around hatching time in the following year. They were accepted readily from day one and were preferred to mealworms. Only the smaller ones were taken for the first few days after which any size was acceptable.

We were using whitebait for other stock that year. I had seen African Starlings years ago relishing Sandeels and decided to try the motmots on a few. Their chicks were about three weeks old when I first gave them some. These were gone by the next feed and during the next few days more were supplied. The birds started to leave

mealworms and earthworms, but not entirely. The amount of whitebait taken that year suggested that they had a large clutch. Sure enough four fledged over a period of two or three days. Without this easily obtainable food I doubt if all four would have survived. We now feed whitebait all the year round but outside the rearing season only one or two are taken daily. Earthworms and a few mealworms make up the chicks diet when they are very young. It is not until they are about a fortnight old that any whitebait appears to be fed to them. We can almost judge how many young there are by the amount of whitebait taken by the parents.

Over the past four years we have reared thirteen young from clutches ranging from one to four. Most references state that the clutch size is three. We have had two of four, so if food is plentiful four would seem just as likely. It is also stated that the young are very vocal in the burrow. We have never heard anything from ours. For birds nesting so low, if indeed they do in the wild, it would seem inadvisable to advertise the whereabouts of the entrance, when the adults are so secretive about it's position.

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## NEWS AND VIEWS

It is always pleasing to receive the latest copy of Kiwi House Review, the magazine of Otorohonga Zoological Society. Although only eight pages, it contains many interesting items, usually concerning endemic species. The society has been pioneering the management of Kiwis for several years now and, under the present curatorship of Eric Fox, has made great strides. The 1990/91 season was extremely successful with six North Island Brown and one Little Spotted Kiwi hatching. I have very fond memories of an all too brief visit to the collection in 1988. Having seen only sleeping Brown Kiwis previously, the experience of being taken around Otorohunga's breeding pens after nightfall to see all three species, and to have two Great Spotted Kiwis reared that year, approaching so close as to prod in search of worms at the side of one's shoe is a fond memory.

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The recently re-discovered Gurney's Pitta *Pitta gurneyi* is now to be given greater protection by the Thailand government. Its last refuge, 20sq kilometres of pristine lowland rainforest, is to be upgraded from its non-hunting status to that of forest reserve. (*World Birdwatch*, December 1990, 4).

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The Greater Adjutant Stork *Leptoptilos dubius* is thought to be one of the rarest storks. Population decline has been attributed to habitat destruction in most of its range. Seventy five active nests in six colonies were found in Assam. (*Specialist Group on Storks, Ibis and Spoonbills Newsletter*, November 1990, 1-3).

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The population of the once common Black-faced Spoonbill *Platalea minor* has fallen to about 300. Restricted to one known breeding site in North Korea its wintering grounds in Taiwan and Vietnam are threatened (*Asian Wetland News*, 3, 14-15).

\* \* \*

Kirkland Warbler *Dendroica kirklandii* has been mentioned in this column several times so it is pleasing to report that its population now seems to be on the increase with 265 singing males being recorded, the highest number since 1961.

\* \* \*

The New Zealand Kakapo Recovery Project has this year been rewarded by the hatching of two chicks, one in an incubator at Auckland Zoo and the other in the natural way on Little Barrier Island. (See Frank Woolham's contribution below. – Ed.).

\* \* \*

A probable first world breeding of the Black-headed Sugarbird occurred in 1989 in the aviaries of M. and D. Law of Luton. Two chicks were reared.

\* \* \*

Two, almost simultaneous, hatchings of the endangered Black-necked Crane *Grus nigricollis* took place in July 1990 in the United States and West Germany. Both pairs were donated to the International Crane Foundation in Wisconsin and Vogelpark Walsrode by the government of China in the hope of establishing these majestic birds in captivity, with the ultimate aim of re-introducing them to the wild. A recent survey has revealed the total wild population to be just over 1,000 birds, distributed mainly in the wetlands of western China.

\* \* \*

The 1990 breeding season seems to have been a very mixed one indeed in the U.K. with very few aviculturists reporting a record year. However, the number of first breedings seems to be high, with Marsh Harrier, Brahminy Kite, Kurrichane Thrush, White-spotted Munia, White-tailed Jay, Sumatran Hill Partridge, Buffons Touraco, Von de Decken's Hornbill and Scaly-crowned Amazon being recorded. It is to be hoped that articles covering the above events will appear in future issues of the A.M.

\* \* \*

A shining example of an organisation that can marry aviculture, conservation, research and diplomacy is the International Crane Foundation, based at Baraboo in Wisconsin. This organisation has strived to increase our knowledge of this elegant and endangered family of birds. Through its quarterly journal, the ICF Bugle, it keeps its membership informed of all its latest activities. The latest, August 1990, issue contains material on the Cuban Sandhill Crane, the rearing of eleven Whooper Cranes from twelve wild taken eggs and the results of the winter count of the seven rarest species of Cranes.

\* \* \*

The Copper Sunbird *Nectarinia cupreas* is the subject of an article in *Foreign Birds*, journal of the Foreign Bird League. A. Ridd (F.B. 1990 p. 102) reports the successful breeding of this African species. It contains much useful information and it is Mr. Ridd's second success with Sunbirds. Collared Sunbirds were reared in 1989.

\* \* \*

The American Federation of Avicultures journal, *Watchbird*, contains much interesting and informative material. The latest issue, August/September 1990, is no exception and subjects covered include the first captive breeding of the Fiery-shouldered Conure *Pyrrhura egregia*. Black-necked Cranes in Nongboatan Marshland Reserve and breeding Lady Ross's Touraco.

\* \* \*

The annual South African National Championship Show for 1990 was held in Cape Town. It's entry included 600 indigenous and foreign birds of which a Scarlet-chested Sunbird exhibited by D. Norval of Natal won the supreme award. Breedings of the year were voted to the Ground-scraper Thrush (F. Hylton, Pietermaritzburg) and the Harlaub's Touraco (A. Mackintosh, Boksburg).

Dave Coles

\* \* \*

Two Kakapos *Strigops habroptilus* on Little Barrier Island raised hopes of successful breedings when they each laid an egg last year (1990). It was the first evidence of breeding by this rare flightless Parrot (only 43 are known to exist) since 1982 when 22 Kakapos were transferred to the predator-free island. However, although one egg subsequently hatched, the chick died after about five days. The other egg proved to be infertile. Since 1974, Don Merton of the New Zealand Department of Conservation's Threatened Species Unit and his colleagues have been trying to save the Kakapo from extinction and in 1989 a \$1.5m five-year recovery plan was launched. The Kakapo Recovery Team has tried to maintain a 'hands-off' policy to minimise risk to the birds, but after the latest breeding failures Don Merton considers that a more aggressive approach is in order. He suggests that had he and his colleagues known that a nestling was sick they could have tried to save it – and had they been aware another Kakapo was incubating an infertile egg it could have been removed to give the bird a chance to re-nest. 'The Kakapo is too rare to leave to its own devices and simply hope for the best,' emphasised Merton.

\* \* \*

Hopes were high when 13 Bali Mynahs *Leucopsar rothschildi* were released into Bali Barat National Park in north-western Bali last year. Of the group, 11 were from a captive-breeding project run jointly by Indonesian biologists, the International Council for Bird Preservation and the American Association of Zoological Parks and Aquaria; the other two birds had been confiscated from poachers.

All 13 birds had spent a year in pre-release training when they were housed in a large, enclosed forested area in the midst of their natural habitat. For several months they were fed through a small door and during the day had no exposure to humans. Researchers handled them minimally and only at night. This careful preparation paid-off handsomely, for jubilant conservationists observed that within two days of their release eight of the birds were feeding and roosting with the wild flock.

\* \* \*

Writing in a recent issue of The American Pheasant and Waterfowl Society's magazine, pheasant enthusiast, Richard Olsen provides information about the progress of a unique pheasant breeding and

conservation project involving major U.S. collections and, in Malaysia, the Department of Wildlife and National Parks and the National Zoo (Zoo Negara Malaysia). He also reports that the following emerged from quarantine in the United States in autumn last year: one cock Malay Great Argus *Argusianus argus*, four pairs of Malay Crestless Firebacks *Lophura erythrophalma*, 3.5 pairs of Malay Peacock-Pheasants *Polyplectron malacense* and eight young, unsexed Rothschild's Peacock Pheasants *P. inopinatum*. All are F1 birds, bred and reared in Malaysia – or in Hong Kong under a co-operative agreement with Dr. K. C. Searle.

\* \* \*

Three years of research and writing has paid off for Professor Janet Kear, Curator of the Wildfowl and Wetlands Trust's Martin Mere (Lancashire) Centre and, until recently, a member of the Council of this Society. Her latest work, 'Man and Wildfowl' has been judged the best natural history book of 1990.

It was selected from all the best natural history titles, published over a 12-month period, by a panel of judges including wildlife artist, Keith Shackleton, editor of *Natural World*, Lynda Bennett, ornithologist and traveller, James Hancock, editor-in-chief of the *Illustrated London News*, James Bishop and environment editor of *Country Life*, David Tomlinson.

Man and Wildfowl throws light upon the special relationship that has existed for many centuries between men and birds. And there are probably few people better qualified to explain human-bird interaction than Professor Kear, a world renowned ornithologist who has worked for more than 30 years to bring people and wildfowl closer together.

\* \* \*

Staff from the San Diego Zoo have been working in Papua New Guinea for a number of years in a rescue programme aimed at preventing the extinction of many rare species in collaboration with the Papua New Guinea Office of Environment and Conservation, the University of Papua New Guinea and the Christensen Research Institute in Madang Province. Birds of Paradise, Flycatchers and Kingfishers – together with a variety of rare seeds and plants – have been taken to San Diego in a race against time before the rapidly disappearing rain forests on the island. A particularly interesting

species collected for the zoo is the Wattled Shrike-tit or Ploughbill *Eulacestoma nigropectus*, an insectivorous species said to behave like a Treecreeper. Little more than 5in long, both cock and hen have heavy bills which are used to hammer decaying wood and bark. The cock is described in the *Birds of New Guinea* (Beehler, Pratt and Zimmerman) as 'unique' and, with extraordinary pink cheek wattles that would not disgrace a Minorca bantam cockerel, it is hard to disagree with that description.

Frank Woolham

\* \* \*

## REVIEW

*The Enchanting Owl* by Connie Toops, 1990, Swan Hill Press, ISBN 185310 1877. 128 pages. Numerous colour photographs. Price £16.95.

This delightful book by Connie Toops reflects the enthusiasm the author has for the subject. Covering all the Northern Hemisphere species, Ms Toops breaks away from the more traditional layout of such volumes. Instead of adopting the species by species approach, she covers her subject in a series of chapters encompassing a variety of behavioural and ecological aspects, even touching upon the subject of owls as educators.

The book is written in a very readable way, unlike many of the more academic volumes on the subject, and is illustrated by some stunning photographs. Sequences covering the snowy owl at a nest feeding chicks and those of the Great Grey Owl hunting are just some of the 108 colour plates which complement the excellent text.

For those interested in owls, as well as those who like a well written, illustrated and produced "bird book", it is to be recommended.

D.C.



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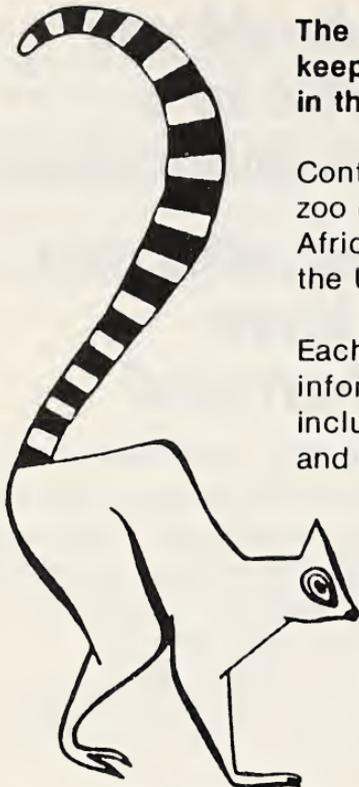
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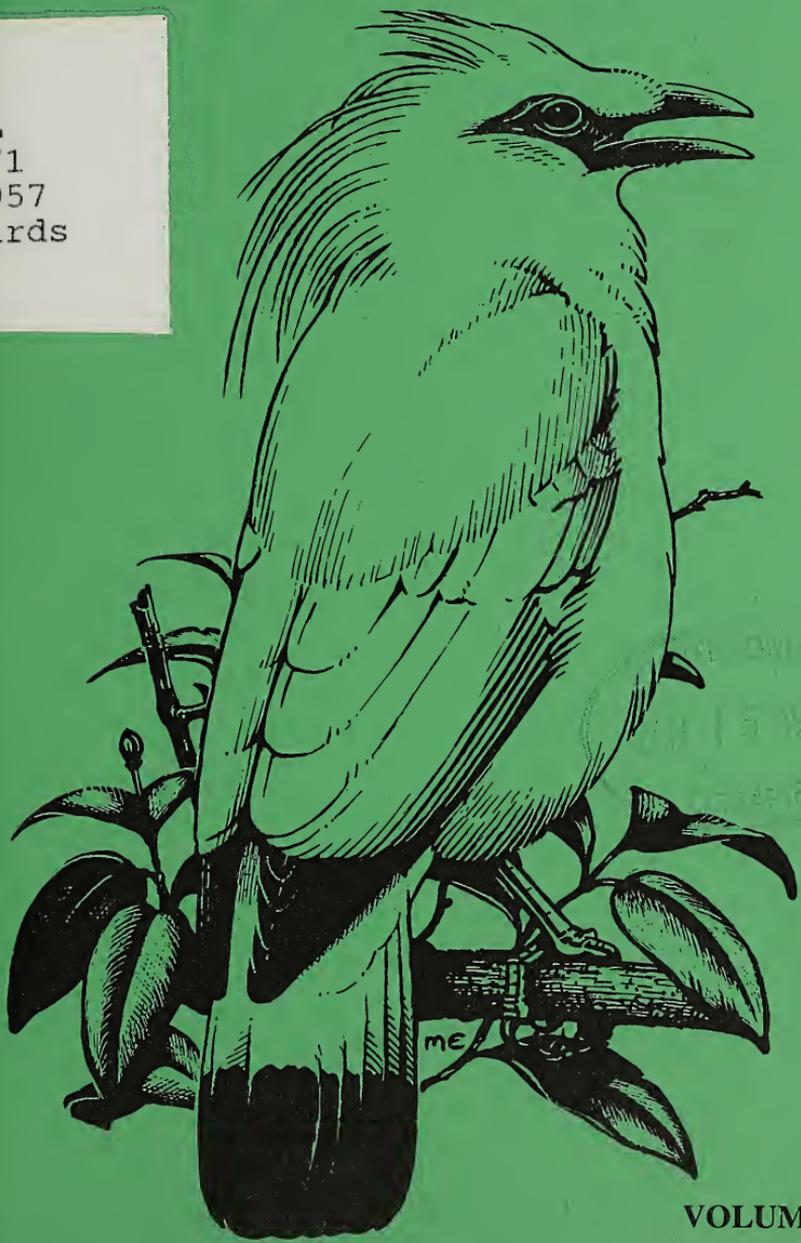
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## CONTENTS

The Cornish Chough; Past, Present and Future (?) By Malcolm Ellis .....	51
North Island Brown Kiwi Breeding Programme at the San Diego Zoo. By Alan Lieberman .....	59
Breeding the Trumpeter Hornbill at Chester Zoo. By Roger Wilkinson and Roger Merry .....	67
Breeding the Hispaniolan Conure at Palmitos Park (Gran Canaria). By Rosemary Low .....	74
Field Observations of some New Guinea Mannikins. By Luis F. Baptista .....	77
British Softbill Imports – Part 4. By Geoffrey Trollope .....	88
Yinberrie Hills – Gouldian Finches and the Mt. Todd Gold Project By Michelle Kanter and Sue Jackson .....	92
News and Views .....	96
Book Reviews .....	103





In the wild the Chough uses its bill to probe for invertebrates.



A pair of Choughs at Paradise Park, Hayle. Although there 'appears' to be a considerable size difference between the two, males and females are almost identical in size.

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## THE 'CORNISH' CHOUGH: PAST, PRESENT AND FUTURE(?)

By Malcolm Ellis (St. Breock, Wadebridge, Cornwall)

Perhaps it will be helpful, particularly for some American and other overseas members, if I begin by explaining that the Chough (pronounced 'Chuff') *Pyrrhonorax pyrrhonorax*, or Palores (digger) in the Cornish language, is a member of the Crow family (*Corvidae*). Sometimes this bird is called the Red-billed Chough, to differentiate between it and the other species of Chough, the Yellow-billed or Alpine *P. graculus*. (The White-winged Chough *Corcorax melanorhamphus*, of Australia, is not a true Chough, or indeed a member of the Crow family, but was so named by homesick Cornish immigrants). The former has a highly distinctive, fairly slender, downcurved and pointed bill which is bright red as are its legs and feet. Like the typical Crows of the genus *Corvus*, it has black plumage, which in bright light can be seen to be glossed with shades of purple, blue and green. This species measures about 38cm (15in), including the bill, which accounts for about 5cm (2in).

Particularly in the past, in Britain at least, this bird was known as the Cornish Chough. Although the Chough no longer occurs in Cornwall, or indeed anywhere in England, it remains closely associated with Cornwall and the name persists. A Chough figures on the Cornwall County Council coat-of-arms, which can be seen on the Tamar Bridge crossing into Cornwall and throughout the county on Cornwall County Council signs, bottle banks, vehicles, etc. (On the latest transfer, the Chough has bright yellow on its wing coverts in place of the more realistic blue on the older design!) A Chough is included on the coat-of-arms on the sides of ambulances and fire engines and is used by Cornish Railways regional division of British Rail. In the Council Chamber of Wadebridge Town Hall, the Wadebridge coat-of-arms has at the top a relief of a Chough. Near Newquay and Stem Cove on the north Cornwall coast, where Choughs last bred in Cornwall and therefore last bred in England, a

Chough figures on the insignia of the Royal Air Force Station, St. Mawgan. These are just some examples of how the Chough is identified with Cornwall. Various other representations of the Chough appear on business logos, etc., and there are ‘Chough’ cafes and restaurants, a ‘Choughs’ darts team and, I think, a wheelchair dance team!

Penhallurick (1978) summarised the distribution and decline of the Chough in southern England. He quoted Christopher Merrett who wrote in 1666 that Choughs occurred “on all sea coasts from Cornwall to Dover”. In 1771 Gilbert White wrote to Thomas Pennant stating that they “still abounded and bred at Beachy Head and on all the cliffs of the Sussex coast”. This species’ decline seemed to become apparent at the turn of the 18th century. According to Penhallurick, Choughs lingered on the Isle of Wight until about 1850 and on the Dorset coast until about 1880, about which time they ceased to breed in south Devon. In north Devon the last recorded nest was in 1910.

On the north Cornwall coast, the Chough continued to breed until at least 1947. That is the year of the last definite successful nesting. According to Darke (Ellis, 1988), in 1951 four birds were seen, in 1954 three, and by 1957 one pair only remained. Each year they carried nesting material into the traditional cave at Stem Cove but failed to breed successfully. Archer-Lock (pers. comm.) wrote that, “in 1963, after the hen had left her nest to join her mate on the slopes, a distinctive cry of a young one was heard coming from the crevice . . .” However, no young one was ever seen. By 1973, the Chough had disappeared from Cornwall and, therefore, from England. The 17th June 1973 is the date of the last recorded sighting of what is regarded as the last truly Cornish Chough. He(?) survived his mate by six years. If those last two Choughs were young hatched during 1947, the last one must have been 26 years old when it disappeared and its mate 20 years old when it was found dead. Although birds of the Crow family are known to be long lived, it seems prudent to treat such ages with circumspection. One or both birds could perhaps have been from a later nesting or come from elsewhere!

During the summer of 1986, two Choughs were observed on the south coast of Cornwall, just west of Plymouth. Where they came from can only be a matter of conjecture, although Cornwall is just within the compass of birds from West Wales. During that winter, one, almost certainly a female, became chronically ill with gapeworm *Syngamus trachea*. The bird’s condition deteriorated and it is thought to have been taken by a Peregrine Falcon *Falco peregrinus* (Meyer,

1989, 1990). The remaining Chough moved away early in 1987.

Long before then, thought had been given to ways of returning this evocative species to its ancestral home on the sea cliffs of the Duchy. Padstow Bird Gardens were first to look seriously at the idea of using aviary-bred Choughs. Their lead was followed by Newquay Zoo (see *News and Views*, Vol. 77, No. 2, p. 77 (1971)), when it became custodian of a small flock of these birds which came from Ireland. Robin Hanbury-Tenison with Lord Eliot, went as far as travelling to the Atlas Mountains of Morocco, to catch Choughs to bring back to release in Cornwall. Such ideas were frustrated, I suspect, because in the first two instances, the birds proved too difficult to breed, far more so than expected, not least because they were so difficult to sex; and in the latter instance because there had been insufficient research into their ecological requirements, which are more exacting than at first seemed likely.

Having been deeply involved in the controversy about whether or not badgers are responsible for transmitting tuberculosis to cattle, Richard Meyer turned his attention to the Chough. There was considerable enthusiasm for Richard's plans. Support came from H.R.H. Prince Charles, Duke of Cornwall, Lord St. Levan, Robin Hanbury-Tenison, various charitable trusts, conservation bodies, etc., and private individuals. However, it was not until another interested Chough keeper, Mike Reynolds of The Rare and Endangered Birds Breeding Centre, Paradise Park, Hayle, Cornwall, stepped in with the main funding (and a camper van!), that the project really 'took off'. 'Operation Chough' was launched on 4th August 1987. The first phase of the project was to attempt to discover why the Chough disappeared from Cornwall and whether suitable habitat still exists for this species to be re-established.

Richard made a detailed habitat assessment of a selection of its former haunts in Cornwall. In addition, he studied old historical records in the County Records Office and consulted the Tithe Commission maps and apportionments from the 1840s, to get an idea of how the landscape has changed in the past 150 years or so during the Chough's most rapid decline and eventual demise. It is not possible to get detailed earlier records. Studies were also made in West Wales, the nearest area to Cornwall where Choughs still live. The idea was to see how the Chough's former haunts in Cornwall compare with its habitat in West Wales, and to study its feeding habits and other behaviour throughout the course of a year.

Results are likely to show that several causes contributed to the Chough's disappearance from the coast of Cornwall. They include

habitat changes, increased human activity, egg collecting, being taken as pets/cage birds, shot to satisfy the fashion for stuffed birds and supply museums, and destruction in gin traps set for rabbits. There is little or no evidence that competition from the Jackdaw *Corvus monedula* contributed to the Chough's decline. Undoubtedly high on the list will be changes in the Chough's habitat caused by modernising agriculture and tourism. A habitat favoured by the Chough, the rough ground/farmland along the cliff-tops, underwent changes brought about by a decline in pastoralism and profound development, much of it associated with the holiday trade and all that it entails, though Choughs co-exist elsewhere with tourism. Year-round grazing of cattle and sheep along the cliff-tops produces short-cropped cliff-top turf, with patches of bare earth and lots of cow pats, etc., where the birds can probe with their slender curved bills and find beetles and their larvae, ants and fly larvae, etc., which form the bulk of their diet. The decline of pastoralism along with an absence of offshore islands, such as exist elsewhere, could have been the death knell for the Cornish Chough, Richard believes.

Dr. M. W. Pienkowski (Bignal and Curtis, 1988) concluded that the Chough needs "a special blend of wild places and land modified by man's agricultural activities"; it needs pasture modified by domestic animals "to produce the optimum conditions for it to exploit its invertebrate prey".



The 'Cornish' Chough, flanked by the now almost extinct tin miner, and threatened fisherman, on the Cornwall coat-of-arms.

Early results from Richard's study show that suitable habitat still exists in parts of Cornwall. An important adjunct could be a programme of cliff-top grazing, including overwintering stock on the cliffs, to ensure a winter food source for the Choughs.

Choughs tend to be sedentary. Therefore, it is unlikely that more than one or two storm-blown or otherwise wayward birds will reach Cornwall. As the two south coast birds show, it is difficult for such birds to establish themselves. Therefore, it is almost impossible that Cornwall will be recolonised naturally. Furthermore, it is highly improbable that wild birds from elsewhere will be allowed to be brought in. Such birds would have to come from Wales, the Isle of Man, Inner Hebrides of Scotland, Ireland or Brittany on the French Atlantic coast, where this species is very rare. These birds of the 'Celtic fringe' all belong to the same race, *P. p. pyrrhacorax*, as did the Cornish birds. They differ in minor respects from the Choughs living in other parts of Europe, North Africa, Ethiopia and Asia.

'Operation Chough's' plan revives the idea of breeding Choughs in aviaries for eventual release into the wild. This might mean establishing Choughs in aviaries at one or more cliff-top release sites which can be kept secure and where research indicates that this species has the best chances of becoming re-established. Richard's hope is that the Choughs will breed in the aviaries and, when the time is deemed right, young birds will be given their first tastes of freedom and sally forth to explore the surrounding areas and gradually revert to wild ways. Whichever means of release is employed, the ultimate aim is that the birds will fly free and choose natural nesting sites among the sea cliffs and their young will recolonise the coast and revert to a truly wild state.

From the avicultural point of view, keeping Choughs is not difficult, but breeding them has proved problematical. The first breeding record in Britain seems to have been as late as 1960, followed by Paignton Zoo in 1972 (Harrison, 1972). Since then quite a number have been bred at Paignton and to a lesser extent at Paradise Park and, perhaps at one or two other public collections, but so far not on a regular and reliable basis. One or maybe two private individuals claim to be successful, but remain guarded about how they achieve their success.

'Operation Chough' has, at considerable cost, been able to buy several birds from the most successful private breeder. Obviously the release programme will require quite a number of Choughs, certainly a minimum of, say, 20, and from as wide a genetic pool as possible. As well as the main release and perhaps an earlier pilot one, it will

be prudent to hold a top-up stock. The project initiated its own aviary-breeding programme, which suffered an early setback when surgical sexing showed Paradise Park's original birds were five males and only one true pair. Luckily six new birds proved to be five females and one male.

1990 began with 13 Choughs, seven males and six females at Paradise Park. Choughs are not sexually mature until two to three years old, and unfortunately only one of the females was of breeding age. That situation was remedied somewhat when a mature male was exchanged for an additional breeding age female from The Wildlife Breeding Centre in Hertfordshire. After a visit to the successful private breeder, it was decided to try a number of birds together, instead of in single pairs. Thus, early in February, the two mature females with their chosen partners and a young pair were housed together in a breeding aviary provided with several nest sites. Two nests were constructed, but no eggs laid. The other immature birds also were provided with nest sites and some nest building occurred. In an attempt to learn more about the Chough's breeding behaviour and improve the chances of success, one of the mature pair's nest sites was equipped with a video camera which relayed the 'action' at the nest. This video monitoring proved very successful and almost certainly will be used again.

Thanks to a generous grant from The Conservation Foundation, five more aviary-bred Choughs were purchased in August. When sexed they proved to be two males and three females. These important additions to the 'Operation Chough' flock undoubtedly increase its breeding potential and already the 1991 breeding season is being looked forward to with renewed anticipation. 'Operation Chough' is in close contact with Padstow Bird Gardens, Paignton Zoo, Chester Zoo and The Wildlife Breeding Centre, all of which have pairs of Choughs and are keen to breed them. It is also exploring the possibility of soon setting up a pilot release project. Any such releases will need to satisfy conservation, scientific and legal requirements.

As mentioned earlier, a contributing factor to the Chough's decline was that many were taken as pets/cage birds. According to Penhallurick, Choughs have been tamed in Cornwall since at least the 16th century. He quoted W. G. Maton (*Observations of the Western Counties of England, 1797*), who found the Cornish so much attached to them "that it was very common to see tame ones in their gardens". William Borlase author of *The Natural History of Cornwall* (1758) had one for some years in his vicarage at Ludgvan.

Penhallurick quoted a letter written by Borlase in 1763. Borlase wrote “Our Chough is now, I think, in its fourteenth year. It has sometimes been sick. Mrs. Borlase is the doctor, and when its appetite appears to be disordered she has grated rhubarb made up with a little meal into a paste with success; if his spirits are low we infuse saffron into his water; and as he has free egress and ingress, appears generally at dinner, knocking at the door if it is shut with his bill till ’tis opened; his place is to perch behind my chair, his favourite dish is the yolk of a boiled egg, which he will take off my plate without leave; if there is any white meat, particularly chicken or veal, he expects his share minced for him, and he flies upon the table and back to his perch without ceremony and manners. It is a bird that loves such familiarity and I apprehend cannot live in solitude where he has not liberties of ranging and varying the scene.” Borlase dispatched Choughs to his London friends, including in 1757, at the request of Dr. William Oliver, two young ones for Mr. Legg the Chancellor of the Exchequer, but neither bird lived long. In his manuscript notes, Borlase wrote of a Mr. Roberts of Truro, who kept a bird for nine years, which could “speak several words exceedingly distinct”.

The Chough has remained popular to the present time. On account of its rarity in Britain, the Chough is now a Schedule 1 species and, as it is throughout Europe, is fully protected, including its nest and eggs.

## ACKNOWLEDGEMENT

My thanks are due to Richard Meyer for reading my manuscript and making many helpful suggestions.

FOOTNOTE: As I was completing the typing of this article, a Chough appeared not far from here, on the north Cornwall coast. Eight months or so later, it continues to live there. It seems to stay almost exclusively in a cliff-top field, grazed by cattle and well supplied with cow pats, and patches of bare earth, etc: classic-type Chough habitat. A known exception was during harsh winter weather, including snow, and when the cattle had been removed, when the Chough moved onto the cliffs below Port Isaac, and foraged between there and Port Gaverne. Enquiries revealed that this is almost certainly an aviary bird released by Grahame Dangerfield. Another was found dead near Bude.

*Cornwall Bird Notes, 1989*, listed some unconfirmed Chough sightings, including some over Padstow, and at nearby Polzeath, one of the Chough's last breeding places in Cornwall.

## REFERENCES

- BIGNAL, E. and CURTIS, D. J. Eds. (1988). Choughs and Land-use in Europe. *Scottish Chough Study Group*, Argyll.
- ELLIS, M. W. Ed. (1988). Operation Chough. The Story of the Cornish Chough – will it ever return? *Operation Chough*, Hayle, Cornwall.
- HARRISON, C. J. O. (1972). Records of first breedings under controlled conditions in Britain, Part 1. *Avicultural Magazine*, Vol. 78, No. 5.
- MEYER, R. M. and SIMPSON, V. R. (1988). Gapeworm in Choughs: further evidence. *Bird Study*, 35, 223-225.
- MEYER, R. M. (1990). Observations on two Red-billed Choughs *Pyrrhocorax pyrrhocorax* in Cornwall: habitat use and food intake. *Bird Study*, 37, 199-209.
- PENHALLURICK, R. D. (1978). *The Birds of Cornwall and the Isles of Scilly*. Headland Publications, Penzance, Cornwall.

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## NORTH ISLAND BROWN KIWI BREEDING PROGRAMME AT THE DAN DIEGO ZOO

By Alan Lieberman  
(Curator of Birds)

For nine years the San Diego Zoo has had the opportunity to establish a breeding record with the North Island Brown Kiwi. Through the manipulation of pairs, the management of eggs and incubation conditions, and a constantly refined and improved chick rearing method, the San Diego Zoo has successfully reared five chicks since 1983, a record outside New Zealand.

Kiwis are flightless birds endemic to New Zealand. Three species have been described; the Brown Kiwi *Apteryx australis*, the Little Spotted Kiwi *Apteryx oweni* and the Great Spotted Kiwi *Apteryx haasti*. Only the Brown Kiwi has recognized subspecies; *A. a. mantelli*, *A. a. australis*, and *A. a. lawryi*. These subspecies occur on the North Island, South Island and Stewart Island respectively. All Kiwis are nocturnal, lay 1-2 egg clutches, and have similar natural histories. The male assumes all incubation and chick-rearing duties. Kiwis have very poor eyesight, and make their living on the forest floor by probing the soil with their long, sensitive bills. They have a keen sense of smell, and in conjunction with their facial bristles, are successful at the detection and extraction of earthworms.

The wild populations of all three Kiwi species seem to be stable. Their ranges have been modified, if not reduced in some areas, but in no cases are they threatened. There now exist laws which protect the Kiwis from capture, hunting, or incidental mortality through the use of unmodified opossum traps. Export of the Kiwi is controlled by the New Zealand Wildlife Service Department of Conservation.

There are numerous New Zealand institutions which currently display one, two, or all three species of Kiwi. A number of these collections have bred the Kiwi – none of which, until recently, has bred their animals predictably and consistently. The most notable of these breeding programmes have been at Otorohanga and Wellington Zoo. Beginning in the 1980s, eggs have been laid and artificially incubated with a resultant increase in chick hatchability and survivability. The first captive hatching outside Australasia was at the National Zoo in Washington, DC, in 1975. (This chick, a male, is currently paired at the National Zoo with a hen hatched at the San Diego Zoo in 1987). Other singular hatchings have occurred at

Jurong Bird Park (Singapore) and Frankfurt Zoo. Historical attempts to establish Kiwi breeding programmes have failed due to a host of problems including incompatibility of pairs, inadequate breeding/exhibit areas, embryonic mortality under conditions of natural incubation, eggs broken by the incubating male, and unsuccessful chick-rearing in both artificial and natural conditions.

*History of the North Island Brown Kiwi at the San Diego Zoo*

The first Kiwi ever exhibited at the San Diego Zoo arrived in 1954 and lived as a singleton for 13 years, until 1967, when it was joined by a female. The original male died ten months later. The female died nearly one year after its arrival. In 1969 two wild-caught males arrived from Auckland, one living for 3+ years and the other now on loan to Brookfield zoo (22+ years of age). In 1973 and 1981, two additional wild-caught males arrived from the National Zoo, one living on exhibit until 1985 (18+ years of age), and the other currently alive. In 1979 two wild-caught females arrived from Auckland to join the three males.

*Breeding History of the North Island Brown Kiwi at the San Diego Zoo*

The San Diego Zoo has had potential breeding pairs since 1979 when there were two pairs and later three males and two females in 1981.

**1981** – The first egg in the collection was laid in 1981. It was incubated by the male and removed after a full term of incubation. It was added and it was not possible to determine fertility.

**1982** – No eggs were laid.

**1983** – Three eggs were laid; two were infertile. The third egg was fertile and hatched under the male. This was the first hatching of a Kiwi in San Diego Zoo's history, and the second hatching outside Australasia. The chick was removed for hand-rearing immediately after hatching. This chick survived for 22 days. The cause of death was a bursal infection.

**1984** – There were two infertile eggs in 1984.

**1985** – A chick was hatched under the breeding male and survived for two days. The cause of death was undetermined. The second egg of that year was laid by a hen in a trio. This egg was infertile.

**1986** – A third chick was hatched, again under the breeding male. This chick was found dead when two days old. The cause of death was trauma, apparently caused by a tearing kick to the belly from the brooding male parent. A second chick was hatched in 1986 (fourth

chick to this point) under the breeding male, removed when one day old, raised to fledge, and sent to the National Zoo.

**1987** – One, possibly two, pre-natal chicks were killed prior to hatching, due to enclosure disturbance and destruction of the eggs by the incubating male. In addition, two infertile eggs were produced in 1987 by the same pair of Kiwis.

**1988** – A total of three eggs were obtained from two pairs of birds. Two were infertile and one was fertile, artificially incubated, hatched, raised to fledge and sent to the National Zoo.

**1989** – Four eggs were produced by the two pairs of birds. The breeding pair produced a chick (artificially incubated) and a second fertile egg that was broken by the male before the egg was removed for artificial incubation. The newly established second pair produced two probably fertile eggs, the embryos of which died early during incubation under the male. The successfully reared chick was sent to the Rotterdam Zoo to pair with their single male.

**1990** – Two fertile eggs were laid, artificially incubated and successfully reared. These birds were, in turn, sent to the Los Angeles Zoo to join their hen, and to the Memphis Zoo to form a future pair. As an additional note, a chick was hatched on 15th March, 1991 and is doing well.

**In summary**, there have been 26 eggs produced since 1981 by three different pairs of Kiwis. Of this number of eggs, 13 were fertile, eight hatched and five chicks survived for more than a year. Two pairs of Kiwis have produced fertile eggs, with one pair hatching chicks.

### *Kiwi Maintenance*

The San Diego Zoo's Kiwi population has been maintained in two enclosures – one on exhibit and one off exhibit immediately behind the display area. The exhibit area is maintained on a reverse night-day cycle while the off-exhibit area is kept under the ambient light regime. The exhibit area light regime imitates the day-night lengths of Auckland.

**Off-exhibit:** The enclosure is a chainlink 'yard' measuring approximately 20' × 30'. It is covered by chainlink to prevent the entrance of predators. There is a water dish with fresh water daily. The base is natural earth. Two open-bottomed wooden boxes are provided, each measuring about 3' (long) × 1' × 1'. The boxes are half-buried in the soil, presenting the Kiwis with a single entrance located at the end of each box. The top of the box is hinged to allow for burrow inspections and removal of eggs and/or chicks.

**Exhibit:** The Kiwi exhibit is a glass-fronted room measuring

approximately 20' × 30'. The floor is mulch and soil. The burrow boxes are the same dimensions as above, but are completely buried. The entrance to each burrow communicates with the surface via a 3' tunnel made from a 3-sided plywood box, open at the bottom.

**Diet:** The birds in each exhibit are fed daily a mixture of  $\frac{3}{4}$  cup soaked hi-protein dog-food with trout chow,  $\frac{1}{2}$  cup ground beef heart and nightcrawlers *ad lib*. The soil is stocked with five pounds of the latter once a week in each exhibit. One of the females will eat two or three mice each day, but she is unique in her taste.

#### *Breeding Behaviour*

Both pairs of birds behave similarly during egg-laying. The pairs will roost together in the same burrow during the non-breeding season. When the female is ready to lay, she will visit the unused burrow, lay her egg and return to the traditional roost burrow. The male will then leave the roost burrow and begin incubating the egg in the second burrow. In only one pair will the male carry material into the incubation burrow. This consists of pine needles and eucalyptus leaves.

**Natural Incubation:** The male will incubate a two-egg clutch, beginning incubation with the first egg. The female lays the second egg usually between two and four weeks after the first egg. The length of time between the first and second egg is a characteristic of the individual female. Only the male will incubate the egg(s), leaving for brief periods to feed. Weights were not taken to determine any weight loss by the male during incubation. Contrary to historical reports, the female will not take part in any aspects of incubation, and will roost in the other burrow for the entire incubation period. The incubation period lasts for 70-71 days, although longer periods have been recorded from New Zealand, both under artificial and natural conditions. Captive male Kiwis are notorious for being unpredictable incubators and fathers. There are numerous accounts of male Kiwis in New Zealand which either break eggs, abandon eggs, or hatch chicks and 'clumsily' kick the neonates to death. For this last reason, the first Kiwi chick to hatch in San Diego in 1983 was removed on hatching, for hand-rearing. Although the chick survived the male's ministrations, it subsequently died after 22 days because of a bursal infection. Because of this death under artificial conditions, fertile eggs laid in 1985 and 1986 were left for the male to incubate and rear. He successfully hatched the chicks, but in both cases, they died when they were two days old. A second egg of 1986 and all eggs laid since have followed the same basic schedule; i.e. the egg is left with the male for forty days, when it is removed and artificially



*Kiwi Chick*

The chick is left in a dark brooder until it is three days old, when it is transferred to a specially built floor brooder. This brooder has a soil base with an indoor-outdoor run. The chick is let outside only after it has regained its hatch weight and the weather is suitably mild. Handling at this age is kept to a minimum so as not to stress the chick.

It is extremely shy and loud noises and bright lights frighten it.

incubated. It is important to mark the egg(s) in order to distinguish the first from the second. This can be helpful if there is a second egg laid, and the first egg is destroyed without a trace. Egg retrievals are done carefully and quickly to avoid molesting the male, and to avoid any unnecessary cooling of the warm egg.

**Artificial Incubation:** Kiwi eggs are more closely related to reptile eggs than to bird eggs and do not require turning during incubation. They demonstrate an extreme temperature gradient from the top of the egg (warmer) to the bottom of the egg (cooler). The temperature of the eggs varies from 37.1°C. (day) to 35.5°C. (night) at the top and from 26.6°C (day) to 26.0°C (night) at the bottom. Artificial incubation is done in a Lyon's, still-air unit at 35.8°C. – 36.1°C. Still-air conditions duplicate a natural gradient, more like an incubating male than a forced air incubator which evenly distributes warm air over the entire egg. The expected weight loss is about 10%. The pip-hatch interval was found to vary from 24 to 96 hours.

### *Chick Rearing*

The last five chicks which were hatched from artificially incubated eggs were hand-reared and not replaced under the male. The inconsistent incubating and brooding behaviour of the San Diego Zoo's breeding males (both pairs) was in agreement with reports from New Zealand regarding their male Kiwi behaviour. The San Diego chicks hatched in 1983, 1986, 1988, 1989 and 1990(2), were all placed in a brooder at 33.8°C. The delicate chick is handled as little as possible to the point of supporting the neonate in the brooder with rolled towels. The chick is weighed on hatching and again when it is three to seven days old, when it is moved on to a sterile soil floor in a brooder. The chick begins walking from day four to six, as it initiates exploration forays in its new environment. The chick begins eating on about day six, and loses 30% of its initial weight in its first two weeks. The chick regains its hatch weight in 30 days. The chick diet consists of papaya, waxworms, red worms, earthworms, ground beef heart, apple, chopped greens, banana and a gruel of beef heart, soya oil, wheat germ, rolled oats, vionate and water, mixed to a soupy consistency.

### *Dispersal of Chicks*

All five chicks which have been successfully reared since 1986 have been transferred to other institutions. To minimize potential risks, the chicks are moved after they are more than six months of age. Two females went to National Zoo to form a trio with their F1 male. One female chick went to Los Angeles Zoo to join their remaining hen, another one to Rotterdam Zoo to pair with their male, and another to Memphis Zoo to form a future pairing with an imported male.

### *Future Prospects of the Captive Kiwi Programme in San Diego U.S.*

Bolstered by the five Kiwis successfully reared in San Diego since 1986, a consortium of U.S. zoos has opened discussions with the New Zealand Department of Conservation with the hope of providing new imports of captive-hatched Kiwis which are now residing in Wellington and Otorohanga. The U.S. Kiwi consortium is comprised of National Zoo, Brookfield Zoo, Los Angeles Zoo and the Zoological Society of San Diego. Additionally, the 1990 hatched chick which was sent to Rotterdam, represents the first exchange of Kiwis between the U.S. and Europe and will hopefully serve as the first step in a long-term exchange of Kiwi blood between two continents. With the recent hatching of a Kiwi at Frankfurt,

exchanges between the U.S. Kiwi consortium and European collaborators is possible. Lastly, we are optimistic that the new San Diego pair of Kiwis, composed of a 1979 imported female and a male on loan from Brookfield Zoo, will continue to lay fertile eggs, eventually resulting in a new genetic line of Kiwis which will strengthen the U.S. population.

## APPENDIX

The following is a list of interesting publications on the Kiwi.

- BOER DE, E.M.L. (1980). Do the chromosomes of the Kiwi provide evidence for a monophyletic origin of the ratites? *Nature* 87:5777.
- CALDER, W., ROWE, B. (1977). Body mass changes and energetics of the Kiwi's egg cycle. *Notornis*, 24:2.
- CALDER, W. (1978). The Kiwi. *Scientific American*. 239:132-142.
- (1979). The Kiwi and egg design: evolution as a package deal. *BioScience*. 29:4.
- CLAYTON, L.J. (1972). Breeding and behaviour of the Kiwi *Apteryx australis mantelli* at the Sydney Zoo. *Int. Zoo Yb.* 12:134-136.
- DAVIES, P., GREENWELL, G. (1976). Successful hatching of a North Island Brown Kiwi at the National Zoological Park, Washington. *Int. Zoo Yb.* 16:86-88.
- FARNER, D.S. et al. (1956). The body temperatures of the North Island Kiwi. *Emu* 56:198-206. exotic forest. *Notornis* 2.
- GOUDSWAARD, R. (1982). The Kiwi chick story. *Wellington Zool. Soc. Newsletter*, Nov. 1982.
- GOUDSWAARD, R. (1983). Some observations on the North Island Brown Kiwi at Wellington Zoo. *Thylacinus* 1983:17-19.
- GOUDSWAARD, R. (1983). The laying of a Brown Kiwi egg at the Wellington Zoo. *Notornis* 30:3.
- GOUDSWAARD, R. (1986). Breeding the North Island Brown Kiwi. *Intern. Zoonews*. No. 197:33/3.
- GREELEY, M. (1983). Believe it or not – a Kiwi. *Zoonooz*. 51:6.
- KINSKY, F.C. (1971). The consistent presence of paired ovaries in the Kiwi *Apteryx* with some discussion of this condition in other birds. *J. Orn. Lp3*. 112 (3):334-357.
- POWLESLAND, R.G. (1988). Kiwi Research and Conservation: An Account of a N.Z. Wildlife Service Workshop 20-21 May 1986. Science and Research Internal Report No. 2.
- REID, B. (1971). The weight of the Kiwi and its egg – composition of a Kiwi egg. *Notornis*, 18:4.
- REID, B. (1972). Measurements and weight of a young chick. *Notornis*. 19:261-266.
- REID, B., WILLIAMS, G. (1975). The Kiwi in Kuschel, G. (ed.) *Biogeography and Ecology in New Zealand*. The Hague: Junk.
- REID, B. (1977). The energy value of the yolk reserve in a North Island brown Kiwi chick. *Notornis* 24:194-195.
- ROBSON, F.D. (1957). Kiwis in captivity. Bull. of the Hawke's Bay Art Gallery and Museum, *Napier*.
- ROWE, B. (1976). A report on five years of keeping Kiwis in captivity in nocturnal

rooms and external enclosures at Otorohanga. *Unpublished report to New Zealand Wildlife Service, Department of Internal Affairs, Wellington.*

(1977). Work on the New Zealand Kiwi. *Gaz. Game Bird Breeder, Avicult. Zool. Cons.* 26:7, 8-10.

ROWE, B., CALDER, W. (1978). Artificial incubation of a North Island Brown Kiwi at the National Kiwi Centre, Otorohanga. *Int. Zoo Yb.* 18:199.

ROWE, B. (1978). Management of Kiwis in captivity. *Progress Report, Otorohanga.*

(1978). Incubation temperatures of the North Island Brown Kiwi. *Notornis*, 25:3.

(1980). The Kiwi. *Int. Zoo Yb.* 20.

STONER, D. (1923). A flightless New Zealand bird. *The Scientific Monthly.* 17:2.

WENZEL, B. (1968). Olfactory prowess of the Kiwi. *Nature.* 220:5172.

(1969). New Zealand's Kiwi. *Zoonooz.* 62:8.

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## BREEDING THE TRUMPETER HORNBILL AT CHESTER ZOO

By ROGER WILKINSON (Curator of Birds)  
and ROGER MERRY (Keeper)

The Trumpeter Hornbill *Bycanistes bucinator* belongs to a group of forest-living species which includes the Brown-cheeked Hornbill *B. cylindricus* and its close allies, the Silvery-cheeked Hornbill *B. subcylindricus* and the Black-and-white-casqued Hornbill *B. brevis*. The Trumpeter Hornbill is one of the two smaller species in this genus and is closely related to the Piping Hornbill *B. fistulator* of West and Central Africa (Snow, 1978). Two other African forest dwelling Hornbills, the Black-casqued Hornbill *Ceratogymna elata* and the Yellow-casqued Hornbill *C. atrata* differ from this group in being larger and in having extensive bare areas of blue facial skin and wattles. Fry, Keith and Urban (1988) treat all species of *Bycanistes* as members of an enlarged genus *Ceratogymna*, the Trumpeter Hornbill then becoming *C. bucinator*. We remain conservative in continuing to follow White (1965) and Snow (1978) by retaining *Bycanistes* as a genus distinct from the larger and more awesome *Ceratogymna*.

The Trumpeter Hornbill is patchily distributed in the forests of sub-equatorial Africa ranging from southern Kenya through Malawi, Zimbabwe and Mozambique into South Africa and westwards across Zambia, Zaire and Angola. Strikingly clad in black and white the sexes are distinguished only by the slightly smaller size of the female and the larger casque of the mature adult male.

In the wild egg-laying occurs from October to January with the birds selecting natural holes in trees or in a rock face. Although for Trumpeter Hornbills the details of the nesting couple remain largely unknown, like other Hornbills the female seals herself inside the nest chamber and this may precede egg laying by more than twelve days (Fry, Keith & Urban, 1988; Millar, 1921). An unsuccessful breeding attempt was recorded at London Zoo in 1936 when it was noted that mudding up of the nest box began in April and that although this was largely the work of the female the mud was carried up to her by the male (Stonor, 1937). That particular breeding attempt began in April and ended in July when the female emerged from the nest box after 94 days without any fledglings. Stonor reports that examination of the box then showed no trace of either eggs or young. As there

was no increase in the amount of food carried to the nest during this period Stonor suggests that either the female failed to lay or that the eggs were eaten by the female.

Our experience with Trumpeter Hornbills at Chester Zoo began when we obtained a pair of these birds in April 1985. These have since been the sole occupants of one of the indoor aviaries of the Bird House. Their aviary measures 6m × 3m × 4.3m high, but because of the destructive nature of these birds in this relatively small enclosure it has been left unplanted. In the Bird House heating is provided only in the winter to ensure the area is frost free. The diet fed to the Trumpeter Hornbills at Chester Zoo consists of chopped fruit; usually apples, pears, tomatoes, grapes and bananas (although other fruit is offered in season), with soaked Diet "A" (SDS Diets) and a coarse insectivorous mixture supplemented with SA37 and "Equivite E". Outside the breeding cycle live food was not normally taken in any quantity and limited to a few mealworms daily.

Shortly after their arrival at Chester a nesting barrel, 66cm high × 53cm diameter, was positioned vertically at a height of about 1 metre in a corner of the aviary. The barrel was provided with an entrance hole of 15cm diameter located 7.5cm below the top of the barrel. A concrete lip was fashioned around its entrance to facilitate mudding up by the Hornbills. Freshly dug clay was provided and kept wet by being immersed in a large water vessel throughout the breeding attempts. No real interest in nesting was shown until 1988 when the female in particular spent some time inspecting the nest barrel but seemed to want to dig out her own entrance. Attempts to block the entrance to the nest barrel with soft wood failed to satisfy the birds and although occasional interest was shown throughout the year, no serious nesting attempt was made. On 17th March 1989, the nest barrel was packed with composted bark so that the entrance hole was entirely blocked with this compacted material. Both male and female Trumpeter Hornbills immediately inspected the nest barrel and the hole was opened up with the dislodged bark forming a pile below the barrel. Over the following ten days the male was observed to stand guard as the female proceeded to remove half of the bark contents from the barrel. On 28th March the female was seen inside the barrel smearing mud around the entrance. At that time, live food started to be taken in increasing quantities. By 3rd April the female was spending most of her time in the barrel mudding up the entrance and the male was then seen feeding her. No courtship feeding of the female by the male had been seen before this time. This contrasts with the London pair for which Stonor (1937) reports the female



One of the two Trumpeter Hornbill chicks fledged at Chester Zoo in 1989.

being fed by the male first in the nest box and then on the aviary floor before she began mudding up the nest box entrance.

The female remained in the nest barrel from 5th April by which time she had mudded up her entrance to a slit of only 2.5-5.0cm

width. From then until 1st May, the mudded entrance was constantly rebuilt, being partially broken then repaired although the female was never seen to leave the nest barrel. The male became extremely attentive and from the commencement of the mudding up increasingly wary of the keeper's presence. The amount of live food taken increased dramatically on 9th May when the food dish was emptied by mid-afternoon. This was taken to indicate that chicks had hatched some 36 days after the female had mudded herself inside the box. At this time and from then onwards live food offered included mealworms, crickets, and locusts. Pink mice and rats although offered were eaten only rarely. Over the nesting period the amount of live food accepted increased to a peak of 100 locusts, 300 crickets and 50g of mealworms each day. These were fed in addition to the usual diet.

The male individually mandibulated and swallowed each food item. It was then regurgitated and offered to the incarcerated female. Similar behaviour has been observed in the wild for the closely related Silvery-cheeked Hornbill *B. brevis*, the Black-and-white casqued Hornbill *B. subcylindricus*, and the Brown-cheeked Hornbill *B. cylindricus*. In all these species the males visit the nest infrequently carrying in their gullets loads of small food items which are then individually regurgitated to be fed to the nesting female. However for all three species noted above the most frequently reported food items were small fruits (Fry, Keith & Urban 1988). This behaviour of infrequent nest visits by the males carrying multiple loads of small food items in the gullet contrasts with that observed in African Grey Hornbills *Tockus nasutus* in which the male frequently visits the nest with single food items carried openly in its bill (Wilkinson & McLeod, 1990).

During the weeks following the incarceration of the female in the nest barrel it was noticed that the pile of bark below the nest disappeared. Captive male African Grey Hornbills carry bark into their nest during the breeding cycle and this may aid nest hygiene (Wilkinson & McLeod 1990). Although it was never witnessed we suspect that this behaviour may also have been shown by the male Trumpeter Hornbill. Fresh bark was made available on 16th June several days after faeces were first noticed around the nest entrance. Neither the female nor the chicks were actually observed to defaecate from the nest entrance although Stonor recorded this for the London female noting that "the droppings were expelled with considerable force".

Stonor noted that the male Trumpeter Hornbill at London became “more and more suspicious of any onlookers” until he would not feed the female if he was being watched. Similarly Millar reported that in the wild a male he had under observation would not feed his mate after he approached closer to the nest tree. The Chester male was also shy of feeding the female in the keeper’s presence and this coupled with the long intervals between feeding the female made observations difficult. It was only when tape recordings of the chicks call together with those of the adults were made on 28th June that we were able to confirm our suspicions that the Trumpeter Hornbills had young in the nest. Immediately following this recording session the chicks were heard on several further occasions. The only time the male was seen to visit the nest barrel when the keeper was visible to him followed the female summoning the male by a rapid knocking of her bill in the nest entrance. The male then flew directly to the nest rather than following his usual behaviour of first flying to a nearby perch and calling to the female before flying up to perch on the barrel itself. No exchange of food was seen when after being summoned the male flew directly to the nest. The breeding attempt culminated with the discovery at 8.00am on 31st July that the mudded entrance to the nest was half broken and one chick had fledged. The male was very excited and vocalised continuously. By early afternoon the female had completely broken the mud rim around the nest and both she and a second chick had emerged to join the excited male. The female and the two chicks emerged in perfect feather. The chicks were of similar size to the female but differed in their less robust and paler casques and were distinguished by conspicuous blazes of chestnut brown feathers above the bill extending to the forehead and back over the eyes, and below the lower mandible.

Both male and female fed the fledglings after they emerged from the nest although for two days the male repeatedly carried food to the then empty barrel. Two weeks after leaving the nest the young Hornbills were joining the adults at the food dish and largely feeding themselves. The amount of live food then taken rapidly decreased to a minimal quantity. The period for which the female was fully incarcerated during this nesting cycle was calculated to be 117 days. Because the dates of egg laying were unknown it is not possible to determine the incubation period but the interval between the female finally mudding herself in and hatching, as indicated by the increased consumption of live food, was estimated as 34 days, and the nestling period as 83 days. Inspection of the nest contents following emergence failed to reveal the presence of any unhatched eggs or the

evidence of failed nestlings. This suggests that the clutch comprised two eggs both of which were successfully hatched and reared. Millar noted that both of the two nests he studied in the wild had clutches of two eggs. Clutches of 1-2 eggs are normal for this genus and noted by Fry, Keith & Urban (1988) for all *Bycanistes* Hornbills with the exception of Trumpeters which are recorded as having 2-4 eggs. Perhaps the normal clutch size also for this species is of five eggs.

The storms of early 1990 necessitated repair work in the Bird House. The Trumpeter Hornbills were then rehoused temporarily and returned to their previous aviary on 26th April. They then immediately inspected the nest barrel which had been refilled with bark. As in 1989 the female excavated the nest barrel and between 29th April and 1st May mudded herself inside the nest chamber. The male was less disturbed by the keeper's presence than during the previous breeding attempt and on 5th June was observed to be very attentive and vocal, carrying live food to the nest as soon as it had been offered. This was taken to indicate a chick had hatched some 36 days after the female had finally incarcerated herself. Over the next two months increased quantities of live food were taken but this amounted to a smaller proportion of the total diet fed than in 1989. On 9th August, some 65 days after their hatching was first suspected the female and two chicks broke out of the barrel. This was a more contracted nesting cycle than noted in 1989, the difference relating to the shorter nestling period. Both adults fed the chicks but these remained dependent on their parents for food for a longer time than in 1989, this being extended to four weeks after they emerged with no reduction in the quantity of live food taken. Thus although the period in the nest was shorter it was compensated by a longer period of post-fledging dependence on the parents. Stonor noted a complete moult of the captive London female during her unsuccessful 1936 nesting attempt. Once moult has been initiated the female may be constrained to remain within the nest to complete her moult even if that nesting attempt fails early in the cycle. Inspection of the nest contents following both successful nesting attempts at Chester indicated that she had moulted wing and tail feathers during the nesting cycle and in both cases she emerged in immaculate feather.

Millar recorded that in nature wild Trumpeter Hornbills plaster up their nest hole immediately after their chicks fledge concealing its presence so as to preserve it for their use in the following year. No such mudding up of the nest entrance was observed following either breeding of the captive birds at Chester. This may, however, in part explain the behaviour of our female in being stimulated to breed after

removing the compacted bark we had packed into the nest entrance.

The breeding of the Trumpeter Hornbill at Chester Zoo in 1989, repeated in 1990, is believed to be the first successful nesting of this species in the United Kingdom. At the Tropical Bird Gardens, Rode, a pair made an unsuccessful breeding attempt in 1989 and at Paignton Zoo a pair of Trumpeter Hornbills successfully reared two chicks in 1990. Other recent reports of breedings of this species from the Netherlands and the United States of America indicate that given sufficient interest Trumpeter Hornbills should not be too difficult to establish in captivity. However they are presently not a conservation sensitive species and therefore some zoos may consider them of greater importance in developing husbandry methods of value in propagating those large Oriental Hornbills presently considered to be threatened in the wild.

## REFERENCES

- FRY, C. H., KEITH, S. & URBAN, E. K. (1988). *The Birds of Africa Vol. 3*. Academic Press, London.
- MILLAR, G. A. (1921). The nesting habits of the Trumpeter Hornbill *Bycanistes bucinator*. *S. Afr. Jnl. Nat Hist* 3. pp 217-219.
- STONOR, C. R. (1937). On the attempted breeding of a pair of Trumpeter Hornbills *Bycanistes bucinator* in 1936, together with some remarks on the physiology of the moult in the female. *Proc. Zool. Soc.* Vol 107a: 89-94.
- SNOW, D. W. (1978). *An Atlas of Speciation in African Non-passerine Birds*, British Museum (Natural History), London.
- WHITE, C. M. N. (1965). *A Revised Checklist of African Non-passerine Birds*, Government Printer, Lusaka.
- WILKINSON, R. & MCLEOD, W. (1990). Breeding the African Grey Hornbill *Tockus nasutus epirhinus* at Chester Zoo, *Avicultural Magazine*. Vol 96, 167-170.

The breeding of the Trumpeter Hornbill at Chester Zoo in 1989 is believed to be the first success in Great Britain. Anyone knowing of a previous breeding in this country is asked to inform the Honorary Secretary.

## BREEDING THE HISPANIOLAN CONURE AT PALMITOS PARK (GRAN CANARIA)

By Rosemary Low  
(Curator, Breeding Centre)

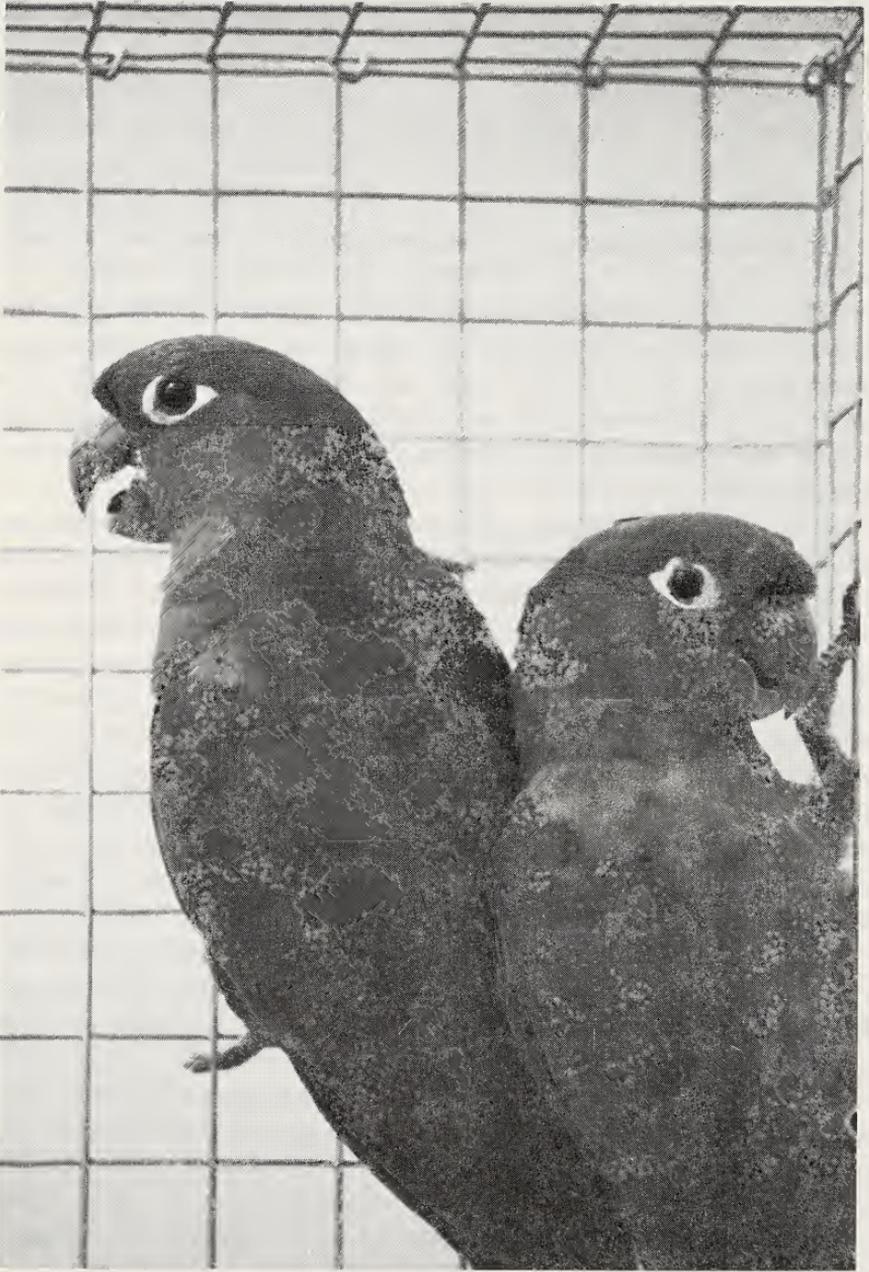
One of the least known of the *Aratinga* Conures is also one of the most modestly coloured, the Hispaniolan *A. chloroptera*. At first glance it is entirely green, except for the red on the bend of the wing and the prominent area of white skin surrounding the eye. It could easily be confused with the White-eyed Conure *Aratinga leucophthalmus* from which it is distinguished by the under wing coverts. Most of these coverts are red in both species but the greater coverts are yellow in the White-eyed species whereas in the Hispaniolan some are red and some are green. It is a medium-sized Conure, measuring about 29cm (11in) and weighing 135g to 170g. Immature birds differ from the adults in having much less red on the under wing coverts. The colour of the iris is reddish-brown (seen in a good light) or dull brown in the young. The bill colour of the adults is an unusual shade, perhaps best described as very pale brown. The White-eyed has a very large range over nearly all tropical South America, but the Hispaniolan is confined to the island of that name which, politically, is comprised of two countries, Haiti and Santo Domingo. It has always been very rare in aviculture. When Thomas Arndt published his book on *Aratinga* Conures in 1981 he stated that he knew of only five specimens in Europe, at Vogelpark Walsrode in Germany and at Palmitos Park on Gran Canaria. It remains rare but fortunately is proving prolific in the breeding centre at Palmitos Park. The first success occurred in 1986 when two young were reared from a clutch of four eggs. This pair has continued to produce one or two nests of young every year and, in 1990, a second pair started to breed. We now have 17 birds, several of which are unrelated to the breeding pair and so we shall be able to make up more unrelated pairs in the future. This is important, with so few birds within aviculture and with the species declining in the wild as a result of their loss of habitat. The decline has been most severe on Haiti. Visitors to the Dominican Republic can still observe the Conure in the wild without making any particular effort. However, habitat destruction has meant that (as has occurred with so many Caribbean island parrots) it is more likely to be seen in the mountains. Nesting occurs in trees and in arboreal termites' nests.

I will relate the breeding cycle of one pair during 1989 and 1990. In the first clutch of 1989 one egg was seen in the nest on 5th May and two eggs on the 10th. They hatched on 2nd and 5th June, giving a 26 day incubation period for the second egg. Both young left the nest on 30th July, 58 and 55 days after hatching. In the second clutch there was one egg in the nest on 15th November and two eggs on the 17th. They hatched on 10th and 13th December, again giving a 26 day incubation period for the second egg. The chicks were closed-ringed at 16 and 15 days with 7.5mm rings. Both young left the nest on 8th February, 60 and 57 days after hatching. All the young from this pair are plucked naked on the underparts and quite badly plucked on the wings while in the nest. However, as their flight and tail feathers are untouched and it is unlikely to be cold when they fledge, the young are left with the adults which are otherwise very conscientious parents.

In 1990 the female laid on 5th and 8th April. On 9th April two new laid eggs from another pair of Hispaniolan Conures were transferred to her nest. The other female, which was hatched at Palmitos Park, was in an aviary containing eight birds, including the young from the previous year, and her previous clutch had been broken. After the removal of the eggs, the new pair was moved to a suspended cage. The incubating female's first chick hatched on 2nd May (after 27 days), another chick hatched on 6th May and one of the fostered eggs on 4th May. The second and third chicks were ringed with 6.5mm rings when aged 16 and 14 days – and this proved to be the correct size for the species. One left the nest on 26th June and the second and third on 29th June.

Favoured rearing foods are fresh corn and spray millet and a mixture of small soaked seeds (canary, hemp and oats). The normal diet is also eaten and this consists of a mixture of sprouted sunflower seed and boiled maize, plus items varied daily such as peas, carrots, cooked butter beans and cooked whole rice. Calcium carbonate is added to this mixture several times weekly and while chicks are in the nest a liquid calcium additive is given frequently in the drinking water and on two or three occasions directly into the chicks' beak. These conures also receive a mixture of chopped fruits, pieces of orange and various fruits in season, such as cactus, which is a favourite of many species.

The Hispaniolan Conures at Palmitos Park have engaging personalities, being inquisitive and active. I suspect that there will never be much demand for them because most other *Aratingas* are more colourful. It is very important, however, to ensure that this species



Two Hispaniolan Conures in the breeding centre at Palmitos Park, Gran Canaria.

is established in aviculture. All parrots from the less affluent Caribbean islands are, alas, potentially highly endangered.

## FIELD OBSERVATIONS OF SOME NEW GUINEA MANNIKINS (*Lonchura* spp.)

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I visited Madang Province (Nitul, Jais Aben, Baitabag, Alexishafen), New Guinea, between 15th December 1988 and 26th January 1989. I spent the week beginning 26th January and ending 3rd February at Port Moresby and its surrounding countryside. During these periods I made observations on five of the 12 mannikin species known to occur in New Guinea. Mannikins are popular cage birds and many species have been kept, yet little is known of their biology in the wild. It is hoped that these notes will stimulate others to make observations on this fascinating group of finches.

### *Habitat*

Four of the five mannikin species treated herein are grassland species. In coastal Madang Province, grassland is recent and the result of rainforest cleared for cultivation and then left fallow. Most of these grassy areas tend to be small and scattered. The one exception is the Streak-headed Mannikin *Lonchura tristissima*, a bird of patchy distribution, which avoids open grassland (Coates 1990). It frequents scrubby regions most often at forest edges (Beehler et al. 1986). I saw them in pairs or in small flocks, but never in large flocks as I did the following species.

The Grand Mannikin *L. grandis* is reported as local and less common than the other New Guinea mannikins, tending to forage in small to medium sized flocks. I found this to be the most common species in Madang. I observed flocks of this mannikin on the outskirts of Nitul (near Jais Aben Resort), near Alexishafen, and at Baitabag. At Baitabag the flock I observed for over a week numbered about 300 individuals.

The Chestnut-breasted Mannikin *L. castaneothorax* is found in both upland and lowland grasslands (Beehler et al. 1986). It was the second most common species encountered both at Madang and Port Moresby.

The Grey-headed Mannikin *L. caniceps* is a lowland species at Port Moresby where the nominate form occurs. A mid-montane

subspecies, which occupies grassland between 1000m-1800m, occurs in southeast New Guinea (Mayr et al. 1968). This mannikin appears to have a more catholic preference for habitats than the other congeners, and is found in savannahs, marshes and riverine grassland (Beehler et al. 1986). I encountered them in small flocks of a dozen or so birds in the savannahs of Port Moresby and vicinity. Flocks may number up to 1,000 birds in September and October when they feed on the ripening grass (Immelmann et al. 1977). I also saw pairs and singletons, notably in the vicinity of Brown River.

The Hooded Mannikin *L. spectabilis* is typically a bird of mid-montane grasslands, and only sparingly a bird of the lowlands (Beehler et al. 1986). Only one individual was observed, on two occasions at Baitabag, Madang Province.

### *Foraging Behaviour*

#### *Seed-eating*

Half-ripe grass seeds are the main diet of the mannikins at all the localities where they were encountered. In the Madang area all four mannikin species fed principally on *Rottboelia exaltata*, a grass reaching up to 6 feet in height (Baptista 1990). Smith (1988 and pers. comm.) found *Rottboelia* to be an important food item for various estrildid species in south-central Cameroon, Africa. The second most favoured foods in this area were the inflorescences of wild sugar-cane *Saccarum robustum*. Grey-headed and Chestnut-breasted Mannikins at the Port Moresby area fed mostly on seeds of *Sorghum nitidum* and occasionally on *Themeda australis*.

Typical of grassland estrildids, all the mannikins observed in this study were adept at perching on vertical stems. The method of foraging depended on the strength of the culms, whether they remained upright or whether they bent over with the weight of a perching mannikin.

The culms of *Saccarum* remain upright, even with the weight of as many as 12 perching mannikins. A Grand Mannikin typically perched on the upright inflorescence culm to peck and remove the small seeds attached to the lateral spikelets. Some individuals were seen grasping the spikelet at the base, then running the bill along its length to the apex, removing the small seeds in the process. Others would pull the spikelets off the culm and fly off to remove the seeds at another spot. The spikelet may be placed across a perch, clamped under one foot, and then pecked at. A flock of Grand Mannikins may eventually strip all the Spikelets off the vertical culm.

*L. castaneothorax* were occasionally seen feeding on *Saccarum*, but

*L. tristissima* were never observed doing so. In contrast to *L. grandis*, *L. castaneothorax* used only one method of feeding: pecking at the spikelets. Perhaps the smaller and weaker bill of *L. castaneothorax* does not equip it to pull spikelets off the main culm in the manner of the Grand Mannikin.

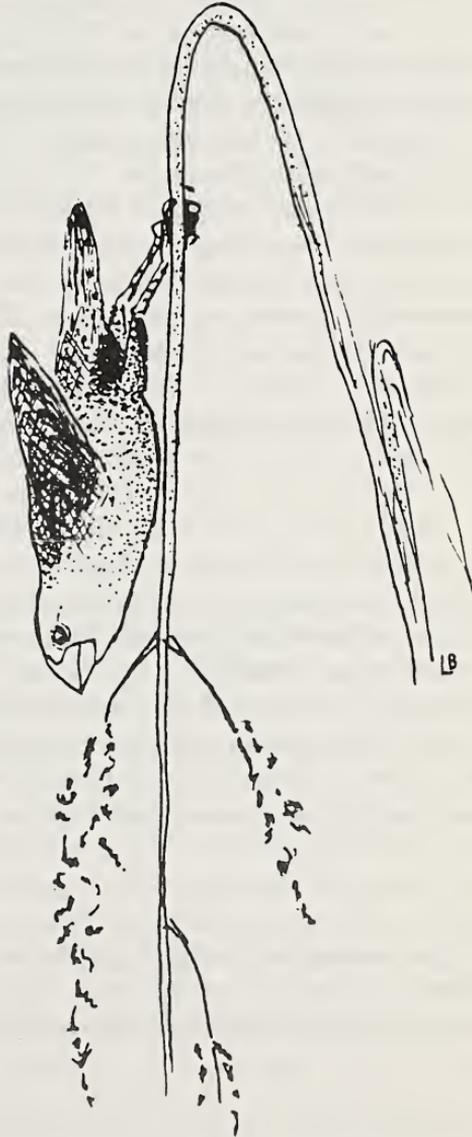


Fig. 1. Grey-headed Mannikin feeding on *Sorghum* seed. The seeding-head has bent-double with the weight of the mannikin which is hanging down to reach the seeds.

Individual mannikins would feed on *Rottboelia* by flying against the stem causing it to bend. They would then slide along the stem to the seedheads and consume the seeds while moving from the spikelet base to the apex. The weak stems of the *Sorghum* grass bends double with the weight of a Grey-headed or Chestnut-breasted Mannikin. Under these circumstances the mannikin hangs upside down, reaches down and plucks seeds off the spikelets (Fig. 1). If the culm of either grass species bends and rests on another plant providing a horizontal perch, other mannikins may also converge on this food source. As many as five mannikins may thus eat from one culm. Chestnut-breasted Mannikins sometimes shared the same seed-heads with Grand or Grey-headed Mannikins.

On 3rd February, I watched a Grey-headed Mannikin employ a unique method of foraging. It landed near the top of a vertical *Sorghum* culm, then slid down the stem to reach seeds protruding from surrounding grasses at a lower level. The action was reminiscent of a fireman sliding down a pole.

As described earlier for Chestnut-breasted Mannikins (Immelmann 1982), a Grand or Grey-headed Mannikin may also perch on a stem, reach out and pull a seeding head from surrounding plants towards itself, then clamp the seeding head onto a perch with one foot and remove the seeds with its bill. I did not see Streak-headed and Hooded Mannikins feed in this manner. However my observations on those species were few. Immelmann (1982) reported that a Chestnut-breasted Mannikin might reach out and seize a seed-head with its bill and then place it under one foot. Once all the seeds were consumed, it reached out and placed yet another seed-head under its foot. This action might be repeated until four or five grass stalks were held with the feet. It flew off when all the seeds were consumed, with the stalks swinging back in various directions.

Juvenile grand Mannikins were also observed foraging on seeding heads of a sedge, *Cyperus iria*, and a grass, *Brachiaria mutica*. The sedge grows to about nine inches in height and the grass to about 18 inches. The mannikins jumped up from the ground and either removed seeds in the process, or pulled the seeding head down and clamped it onto the substrate with one foot and then removed the seeds.

#### *Insect-eating*

On one occasion I observed about six juvenile Grand Mannikins picking objects from the undersides of leaves of Cassava *Manihot esculenta*. I could not see what was being consumed; I suspect that

they were taking small insects. Insects have been found in stomachs of Streak-headed Mannikins on Karkar Island (Diamond and LeCroy 1979).

*L. castaneothorax* have been observed catching flying termites at the beginning of their breeding season in Australia (Immelmann 1982). This behaviour should be looked for in New Guinea.

### *Consumption of Grit*

At 4.45pm on 14th January and at 4.53pm on 15th January, I observed groups of Grand and Chestnut-breasted Mannikins taking grit from the ground. On 14th January two such groups were observed foraging simultaneously. At each spot, as many as 25 birds could be seen feeding at one time, however, these did not represent two separate flocks. Individuals were coming and going from these two sites at regular intervals. On 15th January only one of the sites was being used. No grit consumption was observed on subsequent days. The soil at Baitabag was very chalky and is derived from Pleistocene corals (Matthew Jebb, pers. comm.). In addition to aiding the birds in processing food, the consumption of grit probably provided them with calcium and other minerals (Verbeek 1971).

### *Social Behaviour and Displays*

#### *Flocking behaviour*

Chestnut-breasted Mannikins were often seen flocking with Grand or Grey-headed Mannikins at Baitabag and Moresby respectively. Although Streak-headed Mannikins at Baitabag sometimes foraged with Grand and/or Chestnut-breasted Mannikins, I found that they tended more often to stay apart from the other species. They seemed to favour a certain patch of grass at the forest edge on the southeast portion of the Baitabag site and were mainly seen in pairs or small flocks.

#### *Roosting*

Roosting and feeding sites appeared to be separated by great distances. The congregation of mannikins at that site appeared to consist of many separate flocks which left the feeding site at different times. On 14th January I tried to estimate flock sizes and departure times at Baitabag. The first two flocks left the meadow at 6.04pm (Fig. 2). Eight different flocks left at 6.08pm. Otherwise one or two flocks of mannikins left at intervals of from two to six months. Most of them had departed by 6.33pm when I observed one mannikin calling incessantly, flying in a large circle about ten feet off the

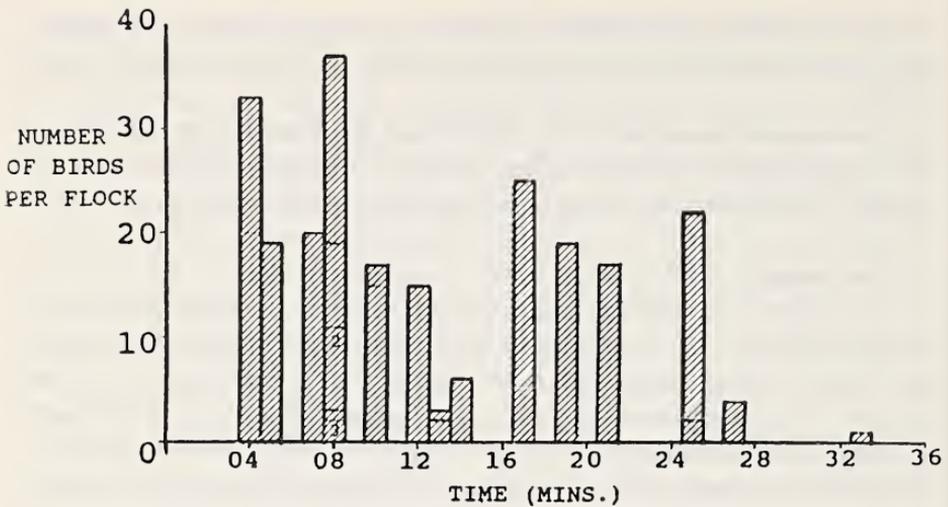


Fig. 2. Sizes of flocks and times of departure (after 6.00pm) of flocks from the Baitabag site on 14th January 1989. Horizontal lines within the columns indicate sizes of other smaller flocks leaving at the same time as those in the columns. At 6.08pm that evening three groups of two and two groups of 11 mannikins left the meadow. Over 90% of the birds observed were Grand Mannikins. The rest were Chestnut-breasted Mannikins.

ground, then climbing to about 70 feet and following the others heading in a southwesterly direction. I estimated that about 320 mannikins left the meadow that night.

Departure was accompanied by much calling, the flocks often climbed up to a height of 50 to 70 feet above the ground, circled over the meadow, and then flew towards the roost. The calling and circling over the meadow might function as a signal to stragglers to join the departing group. Indeed, on several occasions I saw small groups fly up to join the circling calling group.

Although the Grey-headed Mannikins at Moresby foraged as one or two groups as specific sites, arrival and departure was most often in pairs. As pointed out earlier, this may be indicative of birds in the process of breeding. Baitabag birds appeared to represent post-breeding flocks.

#### *Social Behaviour and the Social Tree*

All the mannikin species observed were social in that they often travelled to flocks and fed as a group. However, Grand, Chestnut-breasted, and Grey-headed Mannikins are "distant" species (Sensu Hediger 1964) in that they usually kept a few inches apart from their neighbour upon landing on a perch. Only recently fledged juvenile

Grand Mannikins were seen to perch side-by-side with bodily contact. These observations are similar to those of Oberg (1975) for other mannikins.

The flock of Grey-headed Mannikins was relatively tame, permitting me to make observations on various aspects of their social behaviour. They appeared to feed mostly on two patches of *Sorghum nitidum* grass. These two patches were about 30 feet southeast and southwest respectively, of a bare sapling which was about five feet high. Groups of mannikins would gather on this bare sapling to preen, sing, and to display. Chestnut-breasted Mannikins shared the same display tree with the Grey-headed Mannikins. On one occasion I saw a Grey-headed Mannikin preen the head of another. The preenee fluffed its head feathers and tilted its head away from the preener, who in turn stretched towards the preenee and nibbled at the latter's head feathers. During the hotter periods of the day the flock sometimes gathered in the shade provided by the bases of *Ophiurus tongcalingii*, a green grass with tough canes. At time of observation this grass was not yet in seed; it is conceivable that when fruiting, this grass may provide yet another food source.

### *Undirected Singing*

Displays were observed for only two species, Chestnut-breasted Mannikins and Grey-headed Mannikins, both of which often engaged in undirected singing., i.e. song not addressed at any other bird. In this display the body is erect, the bill is kept wide open and pointed forward, the feathers of the nape, back and belly are raised and ruffled. Ruffling of the belly feathers is more exaggerated in the Chestnut-breasted Mannikin. Holding this posture the bird sings its whisper song, and turns its head in jerky movements from side to side. Two to four seconds elapse between each head-turn.

The whisper songs were so soft that although I was only about 25 feet away from the singers and had a microphone mounted on a parabolic reflector pointed at the singing bird, I could hear no song through my earphones. The songs were drowned by the ambient noise. It is possible that songs may be detected when these recordings are analysed on a continuous spectral analyser which I plan to do at a future date.

Undirected singing is performed throughout the day. Birds often sing upon arrival at the social tree, irrespective of whether other birds are also there. Aborted courtship attempts usually end up as bouts of undirected singing. Birds also sing when resting at the base of the *Ophiurus* grass during the hot periods of the day. On one occasion

I observed a Grey-headed Mannikin carry a green grass stem about two feet in length by one end, fly onto an exposed perch, drop the grass stem, posture and sing. Grass-carrying as a prelude to displaying has been described for other mannikins (Baptista and Horblit 1990).

### *Courtship displays*

During courtship the male Grey-headed Mannikin exaggerated the feather postures seen in undirected singing, i.e. the feathers were erected more. In addition to feathers of nape and belly, those of the rump were also erected (Fig. 3.). The bird twisted the tail in the direction of the female, pointed his bill in her direction, displacement bill-wiped once on the perch, and with bill held wide open sang and approached the female in a series of hops. The bill was pointed down, and the head moved from side to side as in undirected singing. Displays were performed on horizontal branches, but also on erect branches. The male might land below a female on an almost vertical branch then hop upwards towards her. He might approach to within an inch or two of the female. I never saw copulation. No “inverted curtseys” (defined below) were observed.



Fig. 3. Courtship posture of Grey-headed Mannikin. Note that the head is pointed down and the bill is held wide open. Feathers of the nape, rump and lower belly are raised and ruffled providing the impression of broken contours.

I saw only one display performed by a Chestnut-breasted Mannikin. The posture was similar to the Grey-headed Mannikin, except that the body feathers were ruffled from the lower belly almost to the breast, whereas the Grey-headed Mannikin ruffled on the feathers of the lower belly. The adult male Chestnut-breast

displayed to a fledgling. I suspect that the display was not complete, as Immelmann (1982) described an “inverted curtsey” portion in the display, which I did not see in this case. In the inverted curtsey display, the body bounces rhythmically up and down by alternate stretching and bending movements of the legs (Goodwin 1982, Baptista and Horblit 1990).

### *Flight display*

On one occasion I observed a Chestnut-breasted Mannikin fly past within about eight feet from me and about four feet above the ground. Its head was pointed down, its bill held wide open and it was uttering a loud (for a mannikin) series of clicks which sounded like tik-tik-tik-tik-tik . . . It fluttered its wings up and down as it flew past me, glided with wings held out horizontally, fluttered again, glided once more, fluttered once more and then dropped almost vertically onto a patch of *Sorghum*.

### *Discussion*

Diamond (1972) studied mannikins at mid-montane sites in the Eastern Highlands of New Guinea. He found recently created grassy patches distributed as a checkerboard of montane islands, each one supporting only one mannikin species. Diamond suggested that the first successfully colonising species to arrive would prevent the establishment of a second species. I found from two to as many as four mannikin species in each of my lowland study sites. This is perhaps due in part to the fact that the patches of grassland are more extensive in the lowlands and also due in part to the presence of *Rotboelia exaltata*, an abundant food source (Baptista 1990).

Most of the Grand Mannikins observed were juveniles in various stages of post-juvenile moult. Post-juvenile moult in the related Five-colored Mannikin *L. quincolor* begins at the age of about 84 days after hatching (Green 1986). If Grand Mannikins follow a similar schedule, then the youngest begging fledglings encountered must have hatched about mid-October.

Immelmann (1962, 1982) made detailed observations on all the Australian estrildids, and found that the grass finches *Poephilinae* tended to feed on the ground by jumping from the substrate to the seeding heads, whereas the mannikins *Lonchurinae* tended to feed while perched on grass stems and/or holding items with their feet. It is noteworthy that Grand Mannikins (this study) employ both methods of foraging.

Detailed observations on the poephiline estrildids indicate that

most species are highly social and conduct much of their activities on a preferred “social tree” (Zann 1976, Immelmann 1982). Displays and other social behaviour at a social tree were observed in the Grey-headed Mannikin, the only species observed at the start of its breeding season. The presence of social trees should be looked for in the other mannikins.

The courtship display of the Grey-headed Mannikin is described herein for the first time. The posture during courtship is similar to that in *L. castaneothorax*, except that in the latter ruffling extends beyond the belly to the lower breast. The courtship posture of both these species differs from that in the Hooded Mannikin in that during courtship the bill of the latter species points forward (Restall 1989) whereas the bills of the other two species point down.

It is possible that the *L. caniceps* displays described herein are incomplete, and may vary with seasons or with stages in the breeding cycle since inverted curtses usually accompany the courtship displays of related *Lonchura* species.

The flight display described herein for the Chestnut-breasted Mannikin appears to be the first such display described for any mannikin. Immelmann (1982) described a flight display in *Emblema ruficauda* during which the male held a blade of green grass in its bill. These appear to be the only flight displays described to date for estrildid finches.

In summary, as many as four mannikin species may occur together in lowland savannahs of New Guinea. This is in contrast to the highlands where the small grassy “islands” permit the occupancy by only one species. Mixed flocks occur, although the Streak-headed Mannikin appears to be less inclined to join multispecies mannikin groups. The Grand Mannikin equipped with a larger, stronger bill appears to be more versatile in its feeding habits than the other forms observed. Some displays are described including what appears to be the first description of a “flight display” for any mannikin. The Grey-headed Mannikin was observed displaying on a selected “social tree” in the manner of poephiline estrildids of Australia.

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## REFERENCES

- BAPTISTA, L. F. (1990). Feeding observations of some New Guinea birds in Madang Province. *Muruk*, 2: 71-74.
- BAPTISTA, L. F. & HORBLIT, H. M. (1990). The inheritance and loss of the straw display in estrildid finches. *Avicult Mag.* 96: 141-152.
- BEEHLER, B. M., PRATT, T. K. & ZIMMERMANN, D. A. (1986). *Birds of New Guinea*. Princeton University Press, New Jersey.
- COATES, B. J. (1990). The Birds of Papua New Guinea. Vol. III. Passerines. *Dove Publications*. Alderly, Australia.
- DIAMOND, J. M. (1972). Avifauna of the Eastern Highlands of New Guinea. *Publ. Nuttall Orn. Club*, 12.
- DIAMOND, J. M. & LECROY, M. (1979). Birds of Karkar and Bagabag Island, New Guinea. *Bull. Amer. Mus. Nat. Hist.* 164: 467-531.
- GOODWIN, D. (1982). *Estrildid finches of the world*. Oxford University Press, Oxford.
- GREEN, R. (1986). Breeding the five-coloured mannikin. *Avicult Mag.* 92: 181-183.
- HEDIGER, H. (1964). *Wild animals in captivity*. Dover, N.Y.
- IMMELMANN, K. (1962). Beitrage zu einer Vergleichenden Biologie Australischer Prachtfinken (Spermestidae). *Zool. Jahr. Systematik* 90: 1-196.
- IMMELMANN, K. (1982). *Australian Finches*. Angus and Robertson, Sydney.
- IMMELMANN, K., STEINBACHER, J. & WOLTERS, H. E. (1977). *Vogel in Kafig und Voliere*, Prachtfinken, Volume II, Aachen.
- MAYR, E., PAYNTER, R. A., Jr & TRAYLOR, M. A. (1968). Family Estrildidae. In: *Check-List of Birds of the World*, Vol. 14. (J. L. Peters and collaborators). Museum of Comp. Zool., Cambridge, Mass.
- OSBERG, H. (1975). *Gesangs – und Zuhorverhalten bei Prachtfinken (Estrildidae)*. Unpublished Ph.D. dissertation, University of Braunschweig, F.R.G.
- RESTALL, R. (1989). *Reminiscences of rare munias part II*. *Avicult Mag.* 95: 192-209.
- SMITH, T. B. (1988). *Evolutionary ecology of African seed-crackers (estrildidae: Pyrenestes)*. Ph.D. dissertation, University of California, Berkeley.
- VERBEEK, N. A. M. (1971). Hummingbirds feeding on sand. *Condor*, 73: 112-113.
- ZANN, R. (1976). Distribution, status and breeding of black-throated finches *Poephila cincta* in Northern Queensland. *Emu*, 76: 201-206.

## BRITISH SOFTBILL IMPORTS – PART 4

### *Picidae to Musophagidae*

By JEFFREY TROLLOPE (Middlesex)

#### *Picidae* – Woodpeckers

The number of woodpecker species imported has declined in recent years. However, at least two species in the following list appear not to have been imported prior to 1980. These are both in the genus *Celeus*, the Blond-crested Woodpecker and the Rufous-headed. In *Dinoplum*, the common Golden-backed and the Lesser Golden-backed, in *Campethera*, the African Golden-backed and in *Melanerpes* the Yellow-tufted and the Yellow-fronted have been imported. The latter species was bred in the U.K. in 1961. The genus *Picus* has been represented by the Grey-headed and the Banded. The Rufous Woodpecker, which is listed in *Celeus* by some Taxonomists, and retained as a monotypic form in *Micropternus* in some listings, has also been imported.

#### *Ramphastidae* – Toucans

The number of species imported in this family has not shown any decrease until very recently but the number of birds imported, as with softbill import generally has declined. In the genus *Ramphastos*, the Channel-billed, Toco, Keel-billed, Red-billed, Cuviers, Red-breasted and Black-mandibled have been available. Mountain Toucans of unknown species of the genus *Andigena* have been imported. The monotypic Saffron Toucanette, *Bailloni* has been imported on several occasions since 1980. Other species of Toucanette which have been available have included the Guianan and Spot-billed in the genus *Selenidera*, the Curl-crested Aracari, Collared, Black-necked, Lettered and Green in *Pteroglossus* and Chestnut-tipped and Emerald in *Aulacorhynchus*.

#### *Capitonidae* – Barbets

Most genera in this family have been represented by at least a few importations since 1980. Species in *Trachyphonus* have included D'Arnaud's, Levaillant's and Red and Yellow, in *Lybius* Black-breasted, Bearded, Double-toothed, Brown-breasted, White-headed, Red-faced, Black-collared and Veillot's and in *Tricholaema*, Pied and Spot-flanked Barbets and in *Pogoniulus*, Yellow-fronted, Golden-rumped, Lemon-rumped and Red-fronted Tinker birds. In

the large genus *Megalaima*, at least 12 species of Barbet have been imported since 1980, namely Coppersmith, Blue-eared, Blue-throated, Red-throated (Gaudy) Red-crowned, Brown-throated, Green-eared, Small Green, Muller's, Lineated, Green and Great. The Fire-tufted Barbet, *Psilopogon*, a monotypic form, has also been available. In *Semnornis* the Toucan Barbet and its only congener the Prong-billed have been imported. The Red-headed Barbet, the only species apparently available in *Eubucco* and the Five-coloured and Black-spotted in *Capito*, have also been imported. It is interesting to note that 14 species of barbet have been bred in the U.K., 13 of which date from 1970.

#### *Bucerotidae* – Hornbills

Of Ground Hornbills, *Bucorvus*, both the Abyssinian and the Southern species and of *Buceros*, the Rhinoceros, Great Indian and Rufous, have been imported since 1980. Species available in *Bycanistes* have included Silvery-cheeked, Black and White Casqued and Trumpeter, in *Anthracoceros* Malaysian Black, in *Aceros*, Wreathed, Wrinkled and Rufous-cheeked and in *Penelopides* the Tarctic.

*Tockus* species have included Vonder Decken's, Jackson's, Yellow-billed, Red-billed (probably the most frequently imported Hornbill), Malabar Grey, African Grey and African Pied.

#### *Phoeniculidae* – Woodhoopoes

Two species of Woodhoopoe (*Phoeniculidae*) the Green and the Black, have occasionally been imported since 1980.

#### *Upupidae* – Hoopoes

In recent years only the African sub-species, probably *Upupa epops africana*, and *U.e. senegalensis*, have been available.

#### *Coraciidae* – Rollers

The *Coracias* species imported include Abyssinian, Lilac-breasted, Racquet-tailed and Indian. Less often available have been *Eurystromus* species, the Broad-billed Roller and the Dollar Bird.

#### *Meropidae* – Bee-eaters

Bee-eater species which have been available in the genus *Merops*, include Carmine, Blue-tailed, Blue-throated, Green, Little and White-throated.

*Momotidae* – Motmots

As far as can be ascertained, the only Motmot species imported in recent years is the Blue-crowned Motmot (*Momotus*).

*Alcedinidae* – Kingfishers

Kingfishers always been subjects for the avicultural specialist and the number of birds imported is small. Species available in recent years include White-collared, White-headed, Striped, Blue-breasted, Brown-hooded, Woodland and Grey-headed in *Halcyon*, in *Ispidina*, the African Pygmy Kingfisher and in *Ceryle*, the Pied.

*Coliidae* – Colies (Mousebirds)

Three species of Mousebirds are imported occasionally, Blue-naped, Red-faced and Speckled.

*Trochilidae* – Hummingbirds

There has been a notable reduction in the number of Hummingbirds and *Trochilidae* species imported during the last two in three years. Compiling a list of the species imported is difficult because many advertisements and commercial lists refer to generic or group names only. Frequent examples are listings such as “Amazillas”, “Coquettes”, and in some cases, “Hummingbirds”.

Species imported in recent years include the monotypic Purple-collared Woodstar, *Myrtis*, Amethyst Woodstar, *Galliplo*, Purple-throated Woodstar, *Philodice*, Oasis, *Rhodopis*, Black-eared Fairy *Heliathrox*, the Lyrian and Black Metaltails, *Metallura*, Bronzetailed Comet, *Polyonymus*, Green-backed Firecrown, *Sephanoides*, Bronzy Inca, *Coeligena*, Mountain Velvetbreast, *Lafresnaya*, Giant, *Patagona*, Crimson Topaz, *Topaza*, and Whitetip, *Urostitte*.

In the large *Amazilla* genus, Violet-crowned, Rufous-tailed, Plain-bellied Emerald, Andean Emerald, Sapphire-spangled, White-chested Emerald, White-bellied Emerald, and White-bellied have been available as also have, in *Leucippus*, Spot-throated, in *Polytmus*, Green-tailed Goldenthrout, and in *Goldmania*, Violet-capped. Species imported in other genera have included Sapphire-throated *Lepidopyga*, Common and Violet-capped Woodnymph, *Thalurania*, Blue-tailed Emerald, *Chlorostilbon*, Blue-chinned Sapphire, *Chlorestes*, Wire-crested Thorntail, *Popelairia*, Green-throated Mango, *Anthracothorax*, Brown and Green Violetears, *Colibri*, White-necked Jackobin, *Florisuga*, Swallow-tailed, *Eupetomena*, White-tailed and Grey-breasted Sabrewing, *Campylopterus*, and Blue-fronted Lancebill, *Dorythera*.

*Cuclidae* - Cuckoos

Few members of this family have been imported in recent years, only three species in *Centropus*, the Greater, the Lesser and the Senegal Coucal. The Klaas Cuckoo, *Chrysococcyx*, has been available, as also has the Common Koel, *Eudynamys*.

*Musophagidae* - Touracos

There has been an apparent increase in the number of Touraco species imported during the last four to five years. the genus *Touraco* has included Ross's, Violet, White-crested, Hartlaub's, Red-crested, Knysna, Fischer's, Livingstone's, Guinea and Schalow's. (It should be noted the last four "species" are listed as sub-species of the Knysna Touraco by some Taxonomists). In *Corythaixoides* there have been the White-bellied and Common Go-away bird and in *Criniter*, the Eastern Grey and Grey Plantain Eater.

\* \* \*

## **THREAT TO THE GOULDIAN FINCH IN THE WILD**

It will come as a surprise to many aviculturists to learn that the Gouldian Finch is now an endangered species. Its numbers in the wild have declined rapidly, possibly because of infestation with an air-sac mite and possibly because of loss of habitat. Now the remaining, small, wild breeding population is severely threatened by proposed gold mining activities in the birds' restricted habitat by a subsidiary company of Shell International. The following article and appeal for action to prevent the disappearance from the wild for ever of this incredibly beautiful little bird has been written by Michelle Kanter and Sue Jackson of the Threatened Species Network of the Northern Territory. Their address is c/o Environment Centre of the Northern Territory, P.O. Box 2120, Darwin, Northern Territory 0801, Australia.

J.R.H.

### **YINBERRIE HILLS – GOULDIAN FINCHES AND THE MT TODD GOLD PROJECT**

By Michelle Kanter and Sue Jackson (Darwin).

A very large gold mine is currently being planned in the sub-humid tropics of Northern Australia in an area called Yinberrie Hills, near Kakadu – a World Heritage National Park. Unfortunately, the same area is home to one of only two large breeding populations of wild Gouldian Finches known in the world. If the mine goes ahead there is a possibility that it will endanger the species survival in the wild.

The Gouldian Finch is one of the most beautiful birds found in Australia, and many people will have seen it in aviaries. Very few, however, have ever seen it in the wild. Once widely spread across Northern Australia, the Gouldian has declined dramatically in numbers during this century, particularly the last thirty years, and is now officially recognised as an Endangered Species. The reasons for this decline are not fully understood, but researchers have discovered that many wild Gouldians are infested with air-sac mite. Possibly changes to the Finches' habitat due to grazing by cattle and fire has also meant that the birds are not surviving in some places where they used to live.

Two sites have been found where Gouldian Finches breed in substantial numbers. Both are in the Northern Territory, each area containing in the order of 500-800 birds. There are isolated breeding records to the east in Queensland (none recent), and to the west in the Kimberleys of Western Australia, but no other major breeding sites have yet been identified despite extensive searches.

Yinberrie Hills is a small area of rolling hills, covered with a diverse mixed-Eucalypt and Ironwood woodland and a dense grass understorey. Unlike the surrounding area, the Hills are in a near-natural condition and are free from cattle and feral animals. Large ferals such as buffalo, pigs and horses have caused serious habitat degradation throughout most of the Territory, and introduced predators such as fox and cat continue to take a heavy toll on native wildlife. Gouldian Finches nest in unburnt tree hollows of Salmon Gum *Eucalyptus tintinnans* and have specialised diet, eating seeds of *Sorghum sp.* and a few other grasses. They drink daily and require permanent water within a few kilometres of the nest.

The proposed gold mine is a project of the Mt Todd Joint Venturers (MTJV), who are headed by Billiton Australia Gold, a subsidiary of Shell. They plan to mine an extremely large but low-grade, gold deposit on the margin of the Yinberrie Hills and, if approved, mining would start later this year. They will extract and process ore over a 14-19 year period. Mining will involve daily blasting and use of heavy earth-moving machinery; the ore will be processed at a plant next to the pit which will run continuously. The question that must be answered is what effect this activity will have on the Gouldian Finches living in the area. Billiton has expressed concern about the birds and contributed money to World Wide Fund for Nature (WWF) to pay for research, but is this enough? Exploration in the area has already destroyed many potential nest-sites.

The mine site is on the eastern boundary of the Gouldian Finch habitat. The open pit and a water-storage dam will permanently destroy 2.5% of this habitat. A larger dam in the Hills area is now planned, which will cause further destruction. A tailings dam will be sited near the mine and may cause poisoning in birds drinking from the dam. There will be a zone of disturbance around the mine site which is likely to affect Gouldian Finches through the impact of noise, dust, blasting and traffic movement. In addition, mine activities may lead to a change in the fire regime and the introduction of weeds and feral animals. More frequent fires, or hot late-Dry Season fires, may reduce the number of breeding sites and affect food

availability. In May 1990, a control burn in the area of the future pit got out of control and burnt a large area of the Hills.

With the current level of knowledge of the Gouldian Finch's biology, it is impossible to estimate the effects the mine will have on the population. The company says that displaced birds can fly elsewhere in the Hills. They may be physically able to do this, but no-one knows whether they will continue to live and breed successfully. Billiton also believes any impact will only be temporary. However, studies have suggested that the wild Gouldians have a very short life-span. Even a "temporary" impact on their breeding success could be disastrous. In addition, the effects of disturbance may be increased if birds are stressed by mite infestation.

The Mt Todd site, while being traditional country of the Jawoyn people is not land over which the Jawoyn have any legal control, except for sites of tribal significance. The Jawoyn have expressed grave concern for the impact the mine may have on the Gouldian Finch population, on existing water quality, the creek environment downstream of the project area and on bush resources which they still utilise. The Jawoyn are angry about damage that has already been done and have requested that, if the mine were to proceed, processing of the ore should occur off-site, and thus reduce its impact. It is likely that Billiton will locate and want to mine other gold deposits in the Hills area, in order to ensure the economic viability of the project.

While the search for other large breeding sites continues, it is absolutely imperative that known population centres are securely protected. (Billiton maintains that they have located at least 3 other breeding sites. In reality, these have been sightings of one or two juvenile birds.) Currently *no* level of risk to the survival of the Yinberrie Hills birds is acceptable. In fact, it would be far safer to incorporate the area in the Nitmiluk National Park, which is only 10km away. Research can continue to try and work out a way to halt the decline of the species, and eventually help it become re-established over its old range.

Of course there is a large number of Gouldian Finches in captivity. However, most people including aviculturists would be very unhappy with the knowledge that the species was extinct in the wild. It is unlikely at the moment that releasing birds to the wild will be successful. Until we know why wild birds are not surviving, releases are likely to suffer the same fate. Releases may also disrupt natural patterns of genetic variation and further reduce the birds' viability, rather than increase it.

If you are concerned about the impact the Mt Todd Gold Project may have on the survival of the Gouldian Finch there are a number of things that you can do.

– The company, by law, has to produce an Environmental Impact Statement (EIS). This document is their analysis of the impact that mining and subsequent operations would have on the area. It will try to justify how the mine can proceed without having an impact on the Finch population. This will be released for a period for public comment and it is vital that as many submissions as possible are received. If you contact us, we will let you know when the EIS has been released and where it can be viewed, and send you a summary of the Environment Centre's opinion about it.

– In the meantime write to Shell expressing your concern that the mine could have an adverse impact on the Gouldian Finch population and asking them not to mine in the vicinity of the Yinberrie Hills.

– Measures to preserve the Gouldian Finch could be taken in the future by the Federal Government, which will soon enact legislation to protect threatened species. Write to the Federal Minister for the Environment expressing support for the legislation and asking for immediate consideration to be given to the Gouldian Finch.

– Write to the Northern Territory Government, asking that the mine not be approved and full protection be given to the Gouldian Finch.

If you require any further information, let us know; we would also appreciate copies of any letters you may send.

#### *Addresses*

Chairman, Shell International Petroleum Co. Ltd., Shell Centre, London SE1 7NA, UK.

Mr Rich Charlton, Chairman, Shell Australia Ltd., 140 Phillip St, Sydney 2000, Australia.

Ms Ros Kelly, Minister for Environment, Parliament House, Canberra 2600, Australia.

Mr M. Perron, Chief Minister, Northern Territory, PO Box 3146, Darwin, 0801, Australia.

Threatened Species Network of the Northern Territory, Environment Centre NT, PO Box 2120 Darwin, 0801.

## NEWS AND VIEWS

Staff at Adelaide Zoo were jubilant earlier this year when a young Mallee Fowl *Leipoa ocellata* hatched and successfully emerged from its mound – the first successful breeding of the species at the zoo for more than eight years. During the past two breeding seasons, ‘Zoo Watch’ volunteers have spent many hours collecting data on the Mallee Fowl’s behaviour, its activity around the mound, mating, egg-laying, humidity and temperature. The experience gained could provide the basis for a conservation programme at Adelaide Zoo for this threatened species – or in conjunction with that in operation with the South Australian National Parks and Wildlife Service.

\* \* \*

A significant breeding success at Orana Park, Christchurch (New Zealand) was the successful rearing by their parents of four North Island Kakas *Nestor meridionalis septenironalis*. This is the first time this species has bred at Orana Park (which is only the second institution to have bred them). Auckland Zoo has enjoyed continuing success with Kakas and is working in conjunction with Orana Park as co-ordinators of a project with the species.

\* \* \*

The first Demoiselle Crane *Anthropoides virgo* ever bred at the Denver Zoo was conceived by artificial insemination last year. Previously two pairs of the species had produced only infertile eggs and zoo officials decided a number of factors were contributing to the problem – including the fact that the birds were pinioned, thus preventing them engaging in the highly ritualised courtship displays which play a major part in bringing pairs of Cranes to optimum fertility at the same time.

\* \* \*

Two interesting breedings are reported from the United States. At the San Antonio Zoo, Magpie Geese *Anseranas semipalmata* hatched for the second successive year. In 1990, two goslings were hand-reared with a further three being raised by their parents. This year, the adults have successfully reared all four youngsters. The birds are

on loan from San Diego Zoo. At Sea World of Ohio, four Blue-eyed Shags *Phalacrocorax atriceps* hatched earlier this year – the offspring of two adult pairs collected by Sea World as eggs from South Georgia Island. The species is believed not to have been bred previously in any other collection.

\* \* \*

One of San Diego's best-loved and most famous birds, a Salmon-crested Cockatoo *Cacatua moluccensis*, which arrived in the collection in 1925, has died. King Tut was the zoo's official 'greeter' from 1951 to 1989 and although his plumage could not be described as pristine (zoo staff referred to him as a 'ragamuffin'), his friendly, playful personality endeared him to four generations of visitors. An appeal has been launched with the object of creating a permanent monument to the bird.

\* \* \*

Approximately 50 Helmeted Honeyeaters *Lichenostomus melanops cassidix* are known to remain in its sole habitat in Victoria's Yellingbo Nature Reserve. A captive-breeding programme initiated in 1988 led to 12 nestlings and one fledged youngster being successfully established at the Healesville Sanctuary the following year. The intention is to establish a founder stock population of 15 pairs of Helmeted Honeyeaters. Several pairs of Yellow-tufted Honey-eaters *L.m. gippslandiae* will be used as foster-parents. Earlier this year it was reported that three foster chicks had been successfully fledged, with a further four nestlings 'on the way.'

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San Diego Zoo's massive re-building programme has moved forward another step with the opening of Gorilla Tropics, a magnificent rainforest exhibit which cost more than \$11m. In addition to a group of Western Lowland Gorrillas *Gorilla g. gorilla*, some spectacular bird species have been re-housed in the vicinity. Among the more interesting are Racquet-tailed *Coracias spatulata* and Rufous-crowned Rollers *C. naevia*, White-eared Barbet *Stactolaema leucotis*, Fine-spotted *Campethera punctuligera* and Grey Woodpeckers *Dendropicops goertae*, Capuchin Babbler *Phyllanthus atripennis*, Oriole Babbler *Hypergerus atriceps* and Painted Snipe *Rostratula benghalensis*.

The genus *Charmosyna* contains some of the most beautiful avian species in existence. Until comparatively recently they were almost unknown to aviculturists but during the last decade several members of the genus have been imported. Many of them are now being bred in this country and abroad. Is it too much to hope that they will be established as aviary-bred strains? In the last issue of the A.M. there was an interesting article by Dulcie Cooke about her breeding of the Pleasing or Red-flanked Lorriquet *Charmosyna placens*. Now she has been successful with the Red-marked or Red-spotted species *C. rubronotata* and her account of this breeding is awaited eagerly.

\* \* \*

Bristol Zoo, renowned for its very beautiful gardens and for its remarkable breeding successes with several endangered mammalian species, has never given much publicity to its bird collection despite the fact that it has always contained some unusual, interesting and beautiful species several of which, including the Victoria-Crowned Pigeon, have bred successfully. Recently, some of the aviaries have been refurbished and one has been completely re-designed and rebuilt. A simple and delightful official opening of this aviary was performed in May by our President, Miss Ruth Ezra, with her characteristic charm. The aviary, part of which is a walk-through enclosure containing an unobtrusive, ornithological, educational plaque for young children, already accommodates several interesting exhibits including pairs of Rothschild's grackles, Toco Toucans and Luzon Bleeding-heart Pigeons and groups of the lovely Azure-winged Magpie, Golden-backed Woodpeckers, Celebes King Starlings and Red-tailed Laughing Thrushes. Other enclosures house pairs of two species which have bred consistently at the zoo, the Green Imperial Pigeon and the Yellow-collared Macaw, both of which have young again this year.

\* \* \*

It is a long time since news from the Jersey Wildlife Preservation Trust appeared in the Avicultural Magazine. The Trust is continuing its commendable work to save and re-establish many endangered species. Although its Guilding's Amazons have been sent to other collections, it continues to be involved in the organisation of the international breeding programme for this species. The parrot aviaries, of which several new ones have been built, accommodate

now the magnificent St. Lucia Parrot *Amazona versicolor*, of which fifteen young have been reared to maturity since the first successful breeding, and the Thick-billed Parrot *Rhynchopsitta pachyrhyncha* of which 30 young have been produced since 1973. The Trust's success with the White-eared Pheasant and the Palawan Peacock Pheasant is well known and many of both species bred in Jersey have been sent to other collections. The Mauritius Pink Pigeon has also been re-established and no less than 29 young birds were reared in 1990. The Trust has been able not only to supply birds for restocking its natural habitat in Mauritius but also to establish breeding colonies in other collections. Rothschild's Grackle has also bred successfully and the Trust continues to take a very active part in the 'Bali Starling Project Indonesia', I hope that David Jeggo, Curator of Birds, will not forget the promise he gave me, when I visited the trust recently, to write for the Avicultural Magazine.

\* \* \*

Ken Dolton appears to have been wrong when he wrote in the last issue of the A.M. (Vol 97, No.1) that the Duivenbode's Lory Chick bred in his aviaries in 1990 was the first to be parent-reared in this country. In the second edition (1986) of her book "Parrots their Care and Breeding" Rosemary Low describes two successful attempts by a pair in her aviaries to rear their youngsters in 1983 and 1984. Furthermore, Tony Silva refers (Magazine of the Parrot Society, June 1991) to the use of a pair at Loro Parque "with a long proven history of rearing their young" as foster parents for the rare Cardinal Lory!

\* \* \*

In a very interesting Loro Parque Newsletter (No.23, May 91), Tony Silva describes the lengthy, elaborate, occasionally frustrating, but eventually successful efforts, which he and other park officials made to obtain a mate for their female of the extremely rare Red-necked Amazon Parrot *Amazona arausiaca*. The pair appears to be compatible and there is every hope that the birds will breed. The 1991 breeding season started well at Loro Parque and several species of Cockatoo, (including Leadbeater's) Amazon Parrot and Conure (including Queen of Bavaria's) were being reared in May. The newsletter includes lists of species which are sought by and which are available from the park and ends with Tony Silva's opinion that trade in wild parrots will be banned at the next CITES meeting later this year.

The very successful Parrot Society, which celebrates the twenty fifth anniversary of its formation this year, has produced at three year intervals since 1981, a register summarising the breeding results of its members for the year. The register is not only of great interest but also of great importance in demonstrating the activities of private aviculturists in conservation and in emphasising the considerable part which they may play in the future in the preservation of endangered species. In spite of the regrettable fact that less than a fifth of the 5000 membership of the Society made a contribution to the Register the results were remarkable and indicate clearly the role which private aviculture can play in conservation. The Australian parrakeets have maintained their popularity with breeders and almost all of the species of the genera *Alisterus*, *Polytelis*, *Platycercus*, *Psephotus* and *Neophema* are well established with the possible exception of Golden-shouldered and Brown's parrakeets and, of course, Rock and Orange-bellied Parrakeets which have hardly ever been present in European collections. Turquoise and Splendid Parrakeets which are still considered as endangered species are recorded in numbers of more than a thousand. Large numbers of African Peach-faced, Masked and Fischer's Lovebirds were also bred as well as encouragingly increased numbers of the Black-cheeked and Nyassa species which were becoming uncommon in British aviaries. Considerable increases have also occurred in the numbers of Conures, Macaws and other South American Parrots, Cockatoos and African Grey Parrots. The register reflects the recent increase in interest in Lories and Lorrikeets. Imported specimens of many species almost unknown to aviculture have been available in the last few years and the success with which they have adapted to aviary life is shown by the successful breedings recorded in the register which include 15 Stella's, 13 Red-flanked, 8 Fairy and 5 Josephine's Lorrikeets of the genus *Charmosyna* as well as many successful breedings of other genera which, until recently, were more familiar to aviculturists. The Parrot Society deserves our congratulations on this and its other efforts to ensure that our fascinating hobby of aviculture remains viable.

\* \* \*

The press release from the company Databird Worldwide Limited, made in the context of the present political arguments concerning the importation of wild caught birds, is reproduced here in full (despite my aversion to the word 'aviculturalist' and to the use of 'Psittacine'

as a noun). "It has been the policy of Databird Worldwide Limited since 1986 not to import or trade in wild caught birds. This is a very successful policy to date for this organisation. Databird fully supports a total ban of only wild caught birds destined for the pet market. However we do not support a total ban of wild caught birds. There is considerable debate about the capture and trade of 'pest' species of parrot which can be successfully bred in order to generate suitable stock for resale either to the pet trade or for further breeding. Each species must be considered individually and this will always be a controversial area. There are good reasons for limiting the trade of any species from certain countries. Secondly there are species which are suffering from habitat destruction. The species resident on many Indonesian islands are having trees felled from under their feet for use as chop-sticks, hardwood double glazing and doors. In this case the birds have lost nest sites and in some cases even trees to sit in! They will perish. Captive breeding can save these birds and ultimately the species. The arguments concerning captive breeding are often centred around the maintenance of a "diverse gene pool". This is useful but little understood or appreciated. If captive stocks are carefully managed, and this requires the compilation of stud books in many cases, populations of many species can be maintained for numerous generations, this often requires the "trade" in birds to continue internationally to expand the available breeding gene pool enabling breeders in other countries to exchange stock. A total ban on the trade in birds or restrictive registration schemes will negate these issues and impede the continued maintenance of the captive stocks. Databird has, through its breeding, incubation, hand-rearing and research facilities, reared no fewer than 100 different species of Psittacines including Palm Cockatoos *Probosciger aterrimus*, Shining Parrot *Prosopeia tabuensis*, Mullers Parrot *Tanygnathus sumatranus*, Fig Parrots *Psittaculirostris spp.*, and many other rare or endangered species. We also rear large numbers of healthy parrots ideally suited for the pet market enabling us to recommend birds suitable for prospective pet owners. We would not consider selling a Shining Parrot as a pet! During the last six years Databird has formed an excellent relationship with many conservation groups including the International Council for Bird Preservation, Royal Society for the Protection of Birds and Government departments assisting them in any way that we could. Databird has therefore become established as one of the serious breeders, rearers and an authority on captive bred Psittacines in the United Kingdom. The sister company Databird Worldwide Scientific Limited has been established to carry

out research into many and diverse avian fields which include taxonomy, population studies, ecology, and pathology. We are currently involved with many field studies jointly with universities, zoos and private aviculturists on an international scale. The research involving chromosome studies has allowed more than 120 species of Psittacine to be studied (over 400% of the species studies by all other researchers, worldwide). This work has enabled one of only two international chromosomal sexing services to be established, a technique which remains the safest and most accurate way of sexing birds available to aviculturists. DNA fingerprinting is being promoted for Psittacines in both conservation and pedigree analysis for identification. Both companies have promoted in many ways research into a variety of fields, most recently becoming involved with research into Psittacine Beak and Feather Disease, which remains a very serious disease for any Psittacine keeper. Through these research projects and captive breeding we are able to improve the maintenance and propagation of captive Psittacines but also act as an example to government departments and "protectionist" groups that aviculture is acting in the interests of all parrots, especially for their long term future. We must act in a positive way in answering any campaign against aviculture, not aggressively or defensively. After all we all think that we have the interests of the parrots at heart!"

\* \* \*

J. R. Hodges

## BOOK REVIEWS

*Psittaculture – The Breeding, Rearing and Management of Parrots.*  
By Tony Silva. Published by Birdworld, Farnham, Surrey. Price £29.50.

This is a major work by a world renowned Aviculturist. It is very comprehensive with 44 chapters dealing with every aspect of the husbandry of Parrots of many species. It cannot be considered an easy book of reference, for example, if one wishes to look up egg candling, one has to read the whole chapter on incubation. The list of chapters does not compensate for the lack of an index. Some references in the list of contents can be misleading, for example one would not expect to find Greenwing and Amboina Kings lumped together with the popular Australian King under Australian Broadtailed Parrots. The book is handsomely produced in hardback form. It is refreshing to handle a new book published on good quality glossy paper with a huge number of colour pictures taken in aviaries many of which are outstandingly good. This excellent book would have been much easier to read and assimilate if the Author had not let his enthusiasm for writing run away with him, involving overlong paragraphs and the use of esoteric language. In many instances, some of the words used do not feature in the standard English dictionaries. Simple language makes a bigger impression on a greater number of readers and has a grace of its own.

Tony Silva's sentiments concerning the wisdom of giving very careful consideration to all the implications of the work, responsibility etc., before acquiring a pet bird are to be applauded. Those wishing to obtain a parrot will find a tremendous amount of valuable information in the chapters devoted to pets for the home. Perhaps one of this work's greatest strengths is the vast amount of practical advice which it contains, this is the result of experience and is charmingly written on the care, feeding, housing and maintenance of birds. Every aspect is dealt with, from food for different species to aviary sizes, incubation, handrearing and ringing, including the use of microchips. A wealth of detail is given, including the weights of various parrot chicks which is most useful to those embarking on handrearing. The list of ring sizes is also valuable. The recipes for nectar and dry food for Lories and Lorrikeets will be especially useful to those about to take up the keeping of these fascinating birds. Ten Lory keepers are sure to have ten different ways of feeding their birds, and one can learn so much from reading about other people's methods.

There are chapters on all the species of parrots which are available to Aviculture including some very interesting ones on some of the rarities such as the Shining Parrots and Pesquet's Parrot. The last chapter gives details of the "unknowns" which, perhaps some day in years to come, will become available to Aviculture. The appendix on sexual differences in dimorphic species will be of value to many Aviculturists. Perhaps one of the most important chapters in this valuable addition to the works on Aviculture is the one on pressures on wild parrot populations, admirably pointing out the predicament in which both Governments and people find themselves when the preservation of birds cannot be tolerated because of the immense damage they do to crops etc. Many countries can only try to alleviate the stress of lack of food, work etc for their people and at the same time endeavour to set aside some small part of their land for the preservation of endangered species of birds, animals and plants. The writer's heartfelt pleas to all experienced Aviculturists to specialise in one or more undomesticated species of parrot and actively endeavour to breed as many as possible of their chosen bird should not go unheeded. Tony Silva belongs to that group of Aviculturists who really understand the birds in their care and who can communicate with them in much the same way as humans talk amongst themselves. He is obviously a man who can understand every gesture, every look as though it were spoken in human language. This is a rare gift and any book written by such a writer is one to be acquired and treasured.

D.C.

*South African Birds – A Photographic Guide.* By Ian Sinclair. Struik Publishers, Cape Town, South Africa, 1990. ISBN 0 86977 7949. One hundred and forty-four page paperback, with numerous colour photographs and distribution maps.

This is a pocket guide to 265 of the most conspicuous and commonly encountered birds found in Southern Africa. The latter includes the Republic, Namibia, Botswana, Zimbabwe and Mozambique.

There is good overall coverage, from the Ostrich and Jackass or Black-footed Penguin, to the Golden-breasted, Cape and Lark-like Buntings. Several European migrants which winter in the south are included. Aviculturists will find among the 265 species, many familiar and popular park/zoo birds and cage and aviary species.

The margin of each page has a thumbnail silhouette intended to

help identify the different groups of birds. Each species is illustrated, most by one or two colour photographs, one species by three and another by four, depending on the need to show different plumages and/or the bird in flight. The photos, almost without exception of a high standard, are the work of various photographers, including fellow member Neville Brickell.

A map plots each species' range in southern Africa. Because of the tight format of this guide, the maps are of necessity very small. The area of distribution is coloured grey, which on some maps, particularly the coastal bird ones, I found difficult to pick-out. A paragraph of text describes salient features enabling the bird to be identified accurately and there is reference to their preferred habitat.

This guide scores high marks for its photographs and general presentation. Each species' photo or photos, distribution map and text are together on the same page. With one exception, there are two species to each page.

It is suggested that this guide is used in conjunction with more comprehensive books, a good reason, though not necessarily the most important, why I feel it would be helpful to have included scientific names. Also, there must be many like me, who have still to get to grips with metric measurements, and would appreciate the birds' sizes being included in good old-fashioned feet and inches.

M.E.

*Birds of the Transkei.* An ornithological history and annotated catalogue of all recorded species. By C. D. Quickelberge. Durban Natural History Museum, 1989. ISBN 0 620 131403. One hundred and thirty-four page paperback, with one colour plate, 88 colour photographs, several monochrome illustrations and photographs, and a map. Available from the Secretary General, Department of Agriculture and Forestry, Private Bag X5002, Umtata, Republic of Transkei.

Transkei, in case you are wondering, is on the south-eastern corner of Africa. Roughly rectangular in shape, Transkei is only about 250 x 130km (156 x 81 miles). It is bordered to the north by Natal, to the west by Lesotho, to the south by eastern Cape Province, and the eastern side is bounded by the Indian Ocean.

It has a rich avifauna, which includes tropical African species, birds from the drier west and more temperate south, plus Palaearctic migrants. Transkei is badly affected by deforestation, soil erosion and other habitat degradation, and is subject to droughts. Some species have declined or disappeared, others have profited from the changing conditions.

Four hundred and sixty-one species have been recorded, with the suggestion that others remain unrecorded and the true total maybe nearly 500. Scarce or rare there during the early decades of this century, the Cattle Egret was the most common larger (starling-sized upwards) species seen during roadside bird counts carried out between 1969 and 1979. Next in the 'Top 18' larger birds, came three members of the Crow family, then the Yellow-billed (Black) Kite, and Pied Starling, followed by the Cape Vulture. Six colonies of Cape Vultures are known, and there may be others.

Many of the better known African species familiar in aviculture occur there, from the larger ones, down to the sunbirds, among them the Malachite, and most of the popular smaller seedeaters. More unusual species include Gurney's Sugarbird.

This is a well produced and attractively presented publication. Each species is catalogued under its English common name current in southern African ornithology, its scientific name, and where known, its Xhosa name. The author has drawn on data from the latter part of the last century, through to the present time. The records reveal many interesting facts, eg. during the last quarter of the 19th century, thousands of Black-winged Pratincoles appeared each mid-summer (" . . . four shots brought down as many as 50 . . ."), but it seems that this Palaearctic migrant has not been recorded there since 1909. The author attributes its disappearance to locust control measures!

Painted by P. A. Clancey, the excellent colour plate, shows the Spotted and Orange Ground Thrushes. Interspersed among the text are other birds painted by Dr. Clancey. The colour photographs, most by Neville Brickell and Peter Craig-Cooper, show a variety of other species. Other photos give ideas of some of the different kinds of countryside and portray early recorders of Transkei bird-life.

M.E.

*Culturing and Collecting Invertebrate Livefood.* By David Coles. 2 Church Farm Cottages, Lower Basildon, Reading, Berks RG8 9NJ.) Available from the author. Price £5.50.

Dave Coles is to be congratulated on his book concerning livefood for birds. It is an absolute "must" for Aviculturists who keep and often breed Soft-billed birds and for others requiring live food of various kinds. It would of course have added to the cost of the book, but it does seem a pity that it has not been issued in hard back form, and with the addition of photographic illustrations of some of the less well known forms of live food. Illustrations of some of the plants

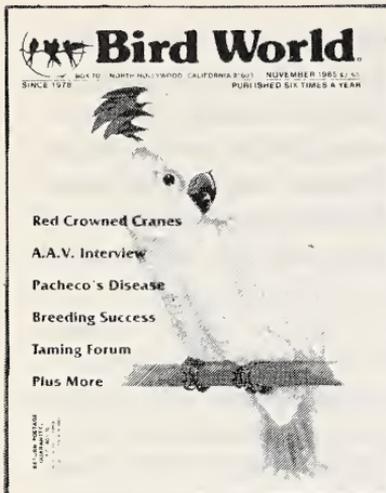
from which live food can be collected would also have been useful. This extremely clear and well organised book gives details of stock, sexing, breeding, life cycles, feeding, handling, and where relevant, health warnings. There is a most useful glossary of terms used in the text and addresses where live food and equipment may be purchased are also included. This book will prove invaluable to everyone who keeps any species of bird requiring live food, and is a most useful source of information for Aviculturists.

D.C.

*Parrots in Captivity.* Proceedings of Symposium 14 of the Association of British Wild Animal Keepers. Obtainable from June Sherborne, 12 Jackley Road, Eastville, Bristol, BS5 6UQ. Price £3.50 (£2.50 to ABWAK members) including postage.

This little book contains the printed versions of seven communications presented at the above Symposium. The subjects ranged from the colony of Roseate Cockatoos at Blackpool Zoo to parrot eggs and throughout particular emphasis was paid to parrot breeding and the role of aviculture in the conservation of endangered species. All of the articles are interesting and original and it is a particular pleasure to see some of the interesting, entertaining, controversial and wise views of Harry Sissons in print! It is a pity that it was possible to include the Editor's synopsis only of Andrew Greenwood's contribution for, clearly, it contained new information and concepts about diseases in parrots. In a remarkably informative introduction the Editor (Rob Colley) referred to the underlying mistrust between the professional zoologist and the private aviculturist which was evident at the symposium. Many private aviculturists have doubts about the ability of zoos to keep and breed parrots and the zoo people are sceptical about private aviculturists' willingness to co-operate in and be committed to a long term project. The symposium provided an opportunity for members of the two groups to meet and work towards a better understanding and resolution of their conflicting views about their mutual interest. It also resulted in the publication of this informative booklet which, I believe, will be of great interest to every aviculturist.

J.R.H.



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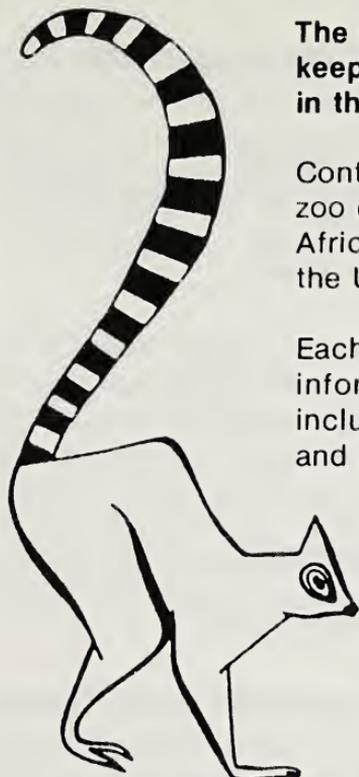
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\* \* \* \*

BOOKS FOR SALE. Limited copies of the subscriber's edition of Tony Silva's *A Monograph of Endangered Parrots*, published in 1989 by Silvio Mattacchione in Canada; signed by artist and author; US\$145.00 each including postage. Also available, signed copies of *Psittaculture: the breeding, rearing and management of parrots*, authored by Tony Silva; contains many color plates; published in 1991; US\$50.00 each including postage. Payment required with order. Speciality Avian Books.  
Contact: 7722 W 82 Street, Bridgeview, ILL 60455, USA.

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Graham Hodgetts, Senior Lecturer in Architectural Metalwork, offers fellow members of the Avicultural Society a unique range of services. His personal delight is in making exotic metalwork aviaries, either to his own designs, or in accordance with clients' particular requirements and specifications. He is also pleased to offer a full design and consultancy service for clients proposing metalwork aviaries, throughout the world. Illustrated details may be obtained from:  
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# AVICULTURAL MAGAZINE



VOLUME 97  
No. 3  
1991

## CONTENTS

The White-eared Conure By Rosemary Low .....	113
The Silver-eared Mesia By L. Gibson .....	118
Successful Propagation of the White-naped Pheasant Pigeon at the Cincinnati Zoo By David A. Oehler .....	123
Jurong Birdpark in Singapore By Richard Perron .....	127
Breeding the Red-spotted Lorikeet By Dulcie Cooke .....	130
Notes from the International Ornithological Congress, Christchurch, New Zealand. By Roger Wilkinson .....	136
The President's Garden Party By Stewart Pyper .....	143
Breeding the Amethyst Starling By Stewart Pyper .....	144
Chester Zoo Notes - 1990 By Dr. Roger Wilkinson .....	147
News and Views .....	154

Corrigendum Volume 97 no. 2, page 72, line 7  
should read:-

"Perhaps two eggs are the normal clutch size also for this species."

# AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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*Rosemary Low*

**White-eared Conure - the smallest and one of the most beautiful of the genus *Pyrrhura*.**

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## THE WHITE-EARED CONURE

By Rosemary Low

(Curator, Breeding Centre, Palmitos Park, Gran Canaria)

The White-eared Conure *Pyrrhura leucotis* was fairly well known in Europe until 1967 when Brazil ceased to permit the export of its fauna. Although two sub-species, *emma* and *auricularis*, are found in Venezuela, they have rarely been exported. In the late 1960s most breeders were interested in Australian parrakeets and the attractive *Pyrrhura* conures were almost ignored. I found them fascinating and kept several species (Low, 1967, 1968) but, regrettably never had the opportunity to obtain *leucotis*. Within a few years it became virtually unknown in the UK and rare or unknown elsewhere in Europe. In February 1989 I moved to Gran Canaria where I was delighted to find eight of the nominate race in the collection, housed together in a large aviary. It is the smallest species of the genus, about 8 in (21cm) long, approximately the length of an exhibition Budgerigar but of a more slender build and weighs about 50g. It is strikingly marked and has rich red-brown cheeks, maroon abdomen and rump, blue nape, white ear coverts and white scalloping on the upper breast. The bend of the wing is scarlet, the tail is maroon and the upperparts are dark green. It is surely one of the most attractive of the genus. It could be confused with the Painted Conure *P. picta* but in this species the white markings on the breast feathers are pointed, whereas in *leucotis* they are rounded.

This article describes the prolific nature of these birds over a period of two and a half years. In 1989 the eight birds (three pairs and two males) were placed one pair per cage in all-wire cages raised above the ground. The cages were 5 ft. (1.5 m) long, 3 ft. 4 in (1 m) wide and 1 m high. They were in an open outdoor area until October 1989 when they were moved to a large enclosed building containing over 100 cages, on metal stands, housing neotropical parrots, Eclectus and lorries. Large open areas in the roof covered by shade cloth (fine mesh plastic netting) make the atmosphere sunny and airy. Enclosed areas like these are necessary in this mountain location to protect the birds from strong sun and high winds.

The Conures had been surgically sexed. Pairs were made up at random since it was difficult to identify individuals to discover whether pair bonds had already been formed. In 1989 only one pair nested. Four eggs were laid and the incubation period was 20 days for each of the last two eggs (unknown for the first two). Two young were reared by the parents and two by Red-bellied Conures *P. frontalis* with one of their own. In 1990 the same female laid the first of three eggs on 16th February. Chicks hatched on 12th, 14th and 15th March and were all reared by the parents. In their second clutch, laid in May, there were again four eggs which hatched, one on 6th or 7th June, two on 8th June and one on 10th June. Again, all were reared without mishap. In 1991, the female nested even earlier. Five eggs were laid, on 10th, 12th, 14th or 15th, and 17th January; the date of the fifth was unrecorded. Incubation apparently did not start until the second egg was laid, for two chicks hatched on 4th February, to give an incubation period of 23 days for the second egg. The other chicks hatched on 6th, 8th and 11th February, hence the incubation period was 22 or 23 days. The weather was cool during the incubation period, as cool as 50 deg F (10 deg C) on some days. The third chick died within a few minutes of hatching and the fifth died when it was five days old, perhaps it was too small to compete with the other chicks - although *Pyrrhuras* are usually good at keeping smaller chicks well-fed. The total production of this pair in three seasons was therefore 16 eggs, 16 chicks of which 14 were reared.

A second pair first nested in 1990. The first of six eggs was laid on 13th March, the second on the 15th the third on the 17th but the dates for the others were unrecorded. All six eggs hatched; the incubation period for the first three was 24 days. All six chicks were successfully reared by the parents. In 1991 the early part of the year was unusually cool, as already mentioned, yet the female laid a few days earlier, the first of six eggs being laid on 3rd March. The second egg was laid on the 6th and the others at two-day intervals. Again, incubation could not have commenced until the second egg was laid, as the first two chicks hatched on 28th March, 25 and 22 days after being laid. The other eggs in the clutch also hatched after 22 days incubation. The smallest of the six chicks was so much smaller than the largest that I transferred it to the nest of a pair of Blue-throated Conures *Pyrrhura cruentata* where it was the eldest in the nest and well-fed. It was with the *cruentata* from days 1 to 22 when it was large enough to be transferred back to its parents' nest. All six chicks were successfully reared. They left the nest between 11th and 20th May and were removed on 7th June. The female laid the five eggs of her second clutch between 10th and 18th June. Unfortunately on 20th June she was observed to have left the nest and the eggs were cold. We then realised that she had been

out of the nest on the previous day. She had a small injury just above her leg, caused by a protruding nail in the nest-box. The eggs were transferred to an incubator but the outcome of this clutch is not known at the time of writing. However, to date the performance of this pair is 12 eggs and 12 young reared in two clutches during a period of 12 months - again 100 % hatchability and 100% rearing success.

Pair number three first nested in April 1990. The female laid the first of six eggs on 1st April and there were five eggs in the nest on the 8th. Her first four eggs hatched after 20, 20, 19 and 18 days incubation. The fifth egg hatched after 24 days and the sixth egg four days later. This was almost certainly because the female ceased to brood the eggs after the fourth chick hatched and the eggs had to rely on the heat generated by the other chicks, thus lengthening the incubation period. As a result, the sixth chick was too small to receive a fair share of food and it died three days after hatching. I now know that later eggs in large clutches should be artificially incubated and returned to the nest as they pip, the eldest chicks then being removed for hand-rearing. In this way, a large size discrepancy between any two consecutive chicks is avoided. In this nest the eldest chick died when it was 13 days old. The reason was not known. In 1991 the female excelled herself by laying nine eggs, at intervals of two and three days, between 7th and 29th April. Every egg hatched, the first two after 24 and 23 days and the others after 21 and 22 days, except the ninth which hatched after 23 days incubation. One hatched in the incubator and another under another pair of *cruentata* to which it was transferred because there were too many eggs in the nest. The chick with the *cruentata* was removed when it was 11 days old and hand-reared. The second chick appeared dehydrated when ten days old when it also was removed and hand-reared. On 7th June these two chicks were returned to the nest-box of their parents; the sixth and ninth chicks had died, so they then had seven in the nest. The first two left just over one week later. By 29th June six young had left the nest. In a period of 13 months this female produced 15 eggs in two clutches, all of which hatched and from which 11 chicks were reared.

In 1990 the four 1989 young were surgically sexed and found to be all females. They were therefore set up in trios with the two surplus males. Before being sexed, however, the six birds were housed together. One pair nested and hatched a chick on 17th July which died at six days. In 1991 one trio of two females and one male produced five eggs in January. One hatched on 15th February but was not well fed after 13 days, so was removed and hand-reared. The fifth egg hatched on 22nd February but the chick was found dead in the nest on the day it hatched. One female was removed from the cage on 20th April - but at the time of writing (the end of June) the other female has not laid again. The other pair fulfilled my

good expectations of the species by producing six eggs, all fertile, the first four being laid on 20th, 22nd, 24th and 26th April. All six hatched, the incubation periods for the third and fourth eggs being 23 and 24 days. Foster parents were urgently needed for a Blue-throated Conure so this was added to their nest and the fifth and sixth eggs were transferred to the nest of a pair of Cuban Conures *Aratinga euops* whose eggs were infertile. At the time of writing, 29th June, only the eldest youngster from this pair has left the nest. The two with the Cubans were badly plucked on the head and breast, but those with their parents, plus the *cruentata*, are all perfect young which should shortly leave the nest. Once again, fertility, hatchability and rearing was 100%.

The number of days the young spend in the nest is usually 43 to 45 but has varied between 42 and 48. At first the young spend very short periods out of the nest so that sometimes one cannot be certain about which day they first left. At this stage their plumage is softer in colour than that of the adults, with less pronounced barring on the breast. There is no blue on the forehead. The maroon patch on the abdomen is duller and less extensive. The skin of the cere and surrounding the eye is whitish (grey in adults). The pads on the sides of the upper mandible are still soft. The young then have a very gentle and appealing appearance. Incidentally, I have tried to discern whether there is any difference in the plumage of adult males and females, but can see none which are consistent.

White-eared Conures readily accept a wide variety of foods. They have a dry mixture of small seeds (canary, safflower, oats and a little hemp and sunflower), some of the mixture for the larger parrots (soaked sunflower, boiled maize (which they leave) and chopped fresh vegetables such as carrot, Swiss chard, and other items in season such as broccoli and radish) and various fruits, either chopped or halved (usually apple, pear, orange, papaya and cactus fruits). Favoured rearing foods are fresh corn, spray millet and sunflower seed. A rearing food made from hard-boiled egg, carrot, whole grain bread and non-fat cheese, is fed as a soft crumbly mixture. Blocks of fine mineral grit are always available and cuttlefish bone is given when possible. Seventeen of the young were housed for some months in two cages right outside my kitchen door. They received many leftovers from the table and would eat almost anything offered, instantly investigating anything placed in the food dishes. When they were moved to a larger aviary, I sorely missed their inquisitive little faces peering in through the window!

All the young were closed-ringed with 6mm or 5.5mm internal dimension rings. The correct size is 5.5mm and the ring should be fitted at about 16 days. The young are left at least one month with their parents after leaving the nest. Two which were hand-reared in 1991 were returned

to their parents' nest which contained another five young, just before they were due to fledge. This is the easiest way to integrate hand-reared young into the family but, of course, can be carried out only if there are other young in the nest. It was a joy to watch them after removal from their parents, in groups of about eight, feeding, bathing or preening together. They are lively, inquisitive and playful in the extreme. At the time of writing we have 28 young in one large aviary, where these characteristics are less apparent.

To sum up the above experiences, five pairs nesting over one, two or three seasons produced 54 eggs, of which 51 hatched and from which 44 young were reared, two pairs rearing young from all the eggs laid. (The nest produced in a small cage with six birds is discounted as the conditions were not suitable for breeding.) Few non-domesticated parrots in aviculture could equal this performance. In a period of 29 months the original eight have increased to 51. One young bird died suddenly when a few months old but no other losses of adults or young adults have occurred. This Conure is undoubtedly a very suitable subject for aviculture. Alas, the day may come when the Brazilian race depends on aviculture for its very existence. In Brazil it occurs only in the south-east (one of the most disturbed and vulnerable rainforest areas in the world), in primary or slightly disturbed forest and at forest edges. Scott and Brooke (1985) include *leucotis* in their list of *Endangered Forest Avifauna of South-eastern Brazil*. It was studied during 1980 to 1982 in the Serra do Tingua, Rio de Janeiro, where it was described as rare, and at the Sooretama Biological Reserve, Espirito Santo, where it was found to be common (more than 10 birds seen or heard daily). This conure has become rare in aviculture. The young reared at Palmitos Park will be sent to other European collections so that hopefully, at least in the UK, the species will at last become established. One of the most attractive of the genus, with a voice which is relatively weak for a conure, it has many qualities to recommend it.

#### REFERENCES

- Low, R.(1967) The Pearly Conure, *Avicultural Magazine* 73,4-7  
(1968) *Pyrrhura* Conures and others, *ibid.* 74,47-48  
Scott, D.A. and Brooke, M. de L. (1985) *Conservation of Tropical Forest Birds*,  
eds A.W.Diamond and T.E.Lovejoy, ICBP Technical Publication no 4.

## THE SILVER-EARED MESIA

By L. Gibson  
(Portland, Oregon.)

The Silver-eared Mesia *Leiothrix argenteauris* is a close relative of the slightly smaller and more common avicultural subject the Pekin Robin *L. lutea*. As its name implies, the Mesia has large ear patches of silver - an unusual colour in feathers. Habits, temperament and care of both species are identical and the reader is referred to the article on the Pekin Robin in the *Avicultural Magazine*, 1978, 84,4-17.

A bird of hill country for preference, the Mesia overlaps the Pekin Robin from the Eastern Himalayas to Western China, but also ranges far to the south, down through Indo-China into Sumatra. Both species are 'bush' birds and are extremely uncomfortable in bare surroundings. Like all of the babbler group, a single *Leiothrix* is nervous and unhappy and every effort should be made to keep them in pairs and in planted surroundings. They are easy birds to maintain in good condition. They can stand any amount of cold if kept in dry, roofed enclosures, with shelter from prevailing winds - as all aviaries should be built.

Mesias are dimorphic, so sexing is no problem. The cock has a scarlet collar, throat and rump. Both birds have a red patch on the wing and this is the only red on the hen. The maximum spread and intensity of the scarlet collar and throat may not be reached until the second or third year. Chicks can be sexed at a week old, just as soon as the tail coverts are through. These are rusty red on males, while the hens' are buff. The pair mates for life and the birds are rarely far apart. They spend much time in affectionate mutual grooming and sleep huddled together.

The birds have quite a variety of chirps and quiet whistles with which they communicate throughout the year. Shared with *lutea* is the angry chattering that alarmed birds make at cats or at strange, brightly coloured, unnatural (i.e. manufactured) objects. Also shared is the explosive alarm whistle they use when chased or caught up. Sometimes this call is made when a crow is nearby. Crows are the only creatures which inspire real fear in all types of birds kept outdoors. The breeding song is a blackbird-loud, five note call with which the cock shakes the surroundings. The cock uses a quiet, often shortened version of this song if he is separated from the hen. She replies with a high-pitched, thin double trill. Also when breeding a quiet 'churr' is made in the privacy of thick vegetation. When the song is warming up at the beginning of the season, or more so when it is winding down in late summer, the cock shortens this to four notes (the

second two, repeated) or he will whistle only two or three notes of the original five. The song is not very musical, but is not unattractive or annoying. Male chicks were heard to make loud and determined efforts at the song when between six and seven weeks of age.

The natural prey is insects, with some vegetable matter as available. Worms are not eaten. A limited variety of fruit is taken, habit probably being the governing factor. My birds readily took chopped grapes, blueberries, and occasionally ate raspberries etc. They consumed half an apple per pair most days of the year and pecked a little at orange slices in warm weather. Banana and other large soft fruit was never touched. They regularly ate a few buds, shoots, flowers and millet that grew in the aviary, but most of the time these items were just picked and dropped. My original wild-caught pair ate powdered dog-food and passed this convenient habit, along with the above food preferences, down to the "grand-chicks". The other mainstay of the diet (as it is with all birds here) was peanut butter and margarine sandwiches, chopped up or put through a hand-operated meat-grinder. When kept outdoors on the above diet, the males developed an intense shade of scarlet. Housing birds indoors has an adverse effect on red colour, as does a restricted diet without, for example, fruit, greens or margarine. Food was placed on a small wooden platform on top of a 20" (0.5m) stand, just outside the kitchen window. This made it easy to check that all birds had access to the food and to note what they were eating.

The original, wild-caught, pair was bought in March and kept in a 4' (1.2m) long cage with sides of plastic sheeting. This type of cage is easy to make, light in weight and is ideal for birds like *Leiothrix* which are inclined to damage themselves against cage wire. An aviary was hurriedly constructed, the pair was put out at the end of May and they obligingly laid eggs by the 22nd of June. Most of my observations were made of the birds in this 16' x 12' (5m x 3.7m) aviary, which was built across an L-shaped part of the house, roofed over and enclosed on three sides. It was open to the south and blinds were put on the clear plastic roof in the summer. The enclosure was built against a large kitchen window, which afforded a view of the whole space, and the birds could be observed over lunch! The only large plant in the first year was a transplanted bushy Camellia, trimmed down to about 7' (2.25m). Camellias are ideal for aviaries and the twig structure provides many nesting sites. Later, the spaces were filled with Hollyhocks, Honeysuckle and Passion Vines and a variety of flowers and ground cover (including Strawberries). The floor was covered mainly with a mulch made of shredded Christmas trees, which provided hours of fun for the birds and also had a pleasant smell of pine.

Unlike *lutea*, the Mesias did not regularly nest with the arrival of 12 hours of daylight. Rather, they waited for a warm sunny spell of weather, which in Portland can occur at any time from February until June. This is probably a reflection of the Mesias' distribution being nearer the Equator. Once they suspended nesting activities with the arrival of a long dull cool spell in the mid-sixties (18° C). Nesting was spread over the period from 16th April to 18th August.. The bill loses its blackish end and becomes clear ivory when the birds are ready to nest. The cock displays by holding a grass stem and stretching bolt upright, with raised head feathers. Both birds then raise the wings above head-height, with the hen sometimes holding grass too. Then they slowly bow heads and bob tightly folded tails. Prior to building, both birds fly ceaselessly back and forth, carrying nesting material. The cock then chooses a site and loops long stems, thin string etc. around twigs to form a nest base. When a substantial base has been built, the hen finishes the greater part of the nest. Usual construction time is three days, with the first nest of the year often taking longer. Many extra nests were built, especially by young birds which built two for every one used. Nests were built in bushes and plants at from 3' - 5 ½'(1 m - 1.7 m.) from the ground and most were made in Hollyhocks. The lowest nest was slung between the stems of a clump of *Helianthus*. Of 18 nests, 17 were constructed of black horsehair, usually with some grass stems forming the base. Sometimes a few dried leaves were incorporated into the lining. In their third summer of nesting, the old pair made a radical departure from the usual by making a nest out of grass and lining it with dried leaves and only a few strands of horsehair. Often the nests tilted badly, especially those in the Hollyhocks, and all were shored up with bunches of dried grass and supported by wiring twigs alongside. Eventually so many twigs were wired to the Hollyhocks that successful nests were built on these without requiring further support. Males invariably went directly to the nest, while hens took a circuitous, more secretive route.

Three large eggs were always laid. These averaged 21.75 x 16 mm (7/8 x 5/8") and completely filled the bottom of the nest. One egg weighed 3.25 g. The eggs are dirty-looking off-white with large reddish brown spots at the bigger end. Spots range from a few in number to a heavy ring of them around the end. Hatching time is usually 13 days from when the hen commences sitting. At night the cock sleeps on the edge of the nest or on an adjacent twig. Sometimes he will sleep in the nest itself, squeezed between the hen and the rim. The cock relieves the hen for up to ten minutes at a time but usually sits just long enough for her to feed. As incubation progresses, cocks sit more frequently, probably because the hens are off more as chicks get closer to hatching. At this stage, one cock

was timed to sit for 47 minutes, in short spells, out of a total of 1 ½ hours. Usually the cock sits for up to 5 minutes at 30 - 40 minute intervals. Newly hatched chicks are the usual pink - tinged grey of young birds, with sparse, dark grey down. The gape is pinkish orange. Chicks in early nests were fed commercial waxmoth larvae and maggots of *Sarcophaga bulata* (a sort of blow-fly) supplemented with mealworm pupae rolled in soft margarine. They also received two or three supplemental hand-feedings from day two to day six, of scrambled egg and margarine mashed in milk. Chicks from the middle of July on were fed almost exclusively on that most useful insect and complete food, the grasshopper. No hand-feedings were given to these chicks but mealworms were put out when grasshopper supplies ran low. About 150 half-grown grasshoppers were caught each day and supplied at intermittent intervals. Plastic sheeting was stapled to the outside lower half of the cage wire to prevent them escaping. Fledglings leave the nest when they are about 12 days old and can fly about 3' (1 m). They immediately scramble up into the highest cover they can find, where both parents feed them. The cock uses non-live food at this stage if no insects are available. Chicks are fed for up to 34 days, although they can feed themselves by three weeks of age. This period is dependent on whether and if the hen lays another clutch. All the chicks and eggs were examined at least once a day, the adults sometimes chattering mildly, or simply waiting quietly to return.

Mesias are excellent aviary birds. They are brightly coloured, bold without being aggressive, become quite tame and they are constantly on the move. This latter is important if you like watching your birds. The only drawback to *L. argentauris* is their propensity for nipping off shoots. It is impossible to establish plants like vines in their presence and they can be hard on flowers and buds. A heavy mass of plants helps to overcome this. In the third summer the wild hen was seen to pluck a sprig of *Nasturtium*. She stood up high in an 'anting' pose and vigorously scrubbed herself with the plant for two or three spells of 10-15 seconds. This action was also previously carried out by a young Pekin Robin hen with an *Actinidia* shoot. As there was an *Actinidia* vine in the next aviary it was tasted to see if it had the same 'nippy' flavour as *Nasturtium*, but it did not. The only obvious common factor was that both sprigs were sappy. This phenomenon must be a trait of the *Leiothrix* genus and it would be interesting to find out what plants are used in the wild, how often and why. All *Leiothrix* are devoted bathers and a dish was kept below a dripping tap for them. Baths varied from a quick dip in freezing weather to several on a hot summer's day. About the only departure from *lutea* behaviour noted was that the Mesias spent a relatively greater amount of time (although still not much) picking over the ground. They are not ground-

scratchers, although prey is often held down with the foot when taken to a branch.

As an experiment, a pair of young birds was left in with the old pair over the winter. They were all quite amicable until spring, when the two cocks began a singing competition. Eventually the old male backed down and became almost totally silent. There were frequent outbreaks of chasing but only two serious tussles between the males, with the respective hens chattering encouragement. Tension remained high when eventually, at 10 months of age, the young pair nested. While they were incubating the old pair also laid but were too nervous to sit. The following day the young pair (or probably the cock) threw the rival's eggs out and pecked holes in them. At this stage the highly nervous old pair were put in another aviary where they immediately raised a family. As soon as they were separated, both cocks recommenced their singing duels. Three generations of birds were raised in three successive summers.

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## SUCCESSFUL PROPAGATION OF THE WHITE-NAPED PHEASANT PIGEON AT THE CINCINNATI ZOO

By David A. Oehler  
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The White-naped Pheasant Pigeon *Otidiphaps nobilis aruensis* is found on the Aru Islands. This bird, like other subspecies of Pheasant Pigeon, differs from the other members of the family *Columbidae*. The relatively short wings combined with a greatly reduced furcula make these birds weak fliers. Other differences include the presence of a row of well defined rectangular scutes down each side of the posterior half of the strong tarsi, twenty-two tail feathers (more than any other *columbid*) and a modification of the coracoid arteries (Glenny and Amadon 1955). These birds have long legs and a slender neck. The breast and underparts are glossy blackish-purple. The wing coverts and secondaries are chestnut. The bill is bright red and the legs are yellow suffused with black. Unlike



D. Oehler

Adult male White-naped Pheasant Pigeon.

the Green-naped Pheasant Pigeon, *Otidiphaps nobilis nobilis*, the White-naped lacks the short nuchal crest (Goodwin 1983). The tail is black with a greenish gloss and tends to be longer in the male than in the female. As its name implies, a white patch is found on the nape and hind neck. The Pheasant Pigeon feeds and lives on the forest floor (Mayr and Rand 1937). These birds are roughly 45cm (18 in) in length. When walking, the folded, tentlike tail is pumped up and down (Beehler, Pratt & Zimmerman 1986).

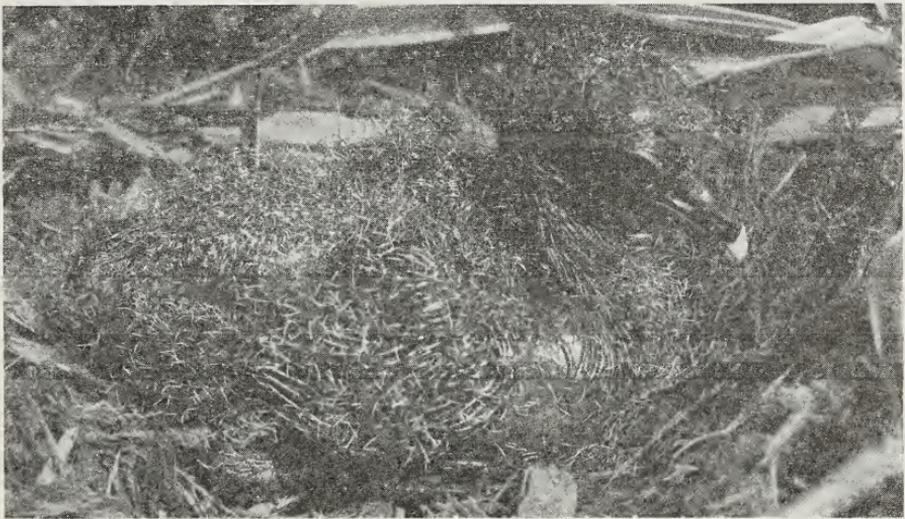
Several facilities have bred the nominate form, the Green-naped Pheasant Pigeon, in captivity (Black 1930, Hall 1987, Kuehler 1989). Evidence of captive propagation of the White-naped Pheasant Pigeon prior to the hatching at the Cincinnati Zoo seems to be nonexistent. The Cincinnati Zoo acquired two pairs of wild caught White-naped Pheasant Pigeons in February 1987. All four birds were housed in enclosures with average dimensions of 1.8 m x 1.8 m x 2 m high (5 ft. 10 in x 5 ft. 10 in x 6 ft.). The display cage utilized sets of skylights augmented with artificial lighting, while the off exhibit enclosure was entirely lit artificially. The diet of premixed pigeon seed, diced fruit, hard-boiled egg with a mix of soaked dog chow, peanut butter and cottage cheese was offered throughout the day. Only the dry seed was available *ad lib*. Vitamin supplements in the form of Nekton-S and Nekton-Bio were added to the fruit.

Egg production from both females began in 1988. The eggs were laid overnight only to be destroyed on the arrival of the Aviculture staff and the turning on of the display's lights. In January 1989 one pair of pigeons was transferred to the Butterfly Aviary in the Insect World. This "greenhouse" aviary measures 6.2 m x 16.9 m x 6.2 m high (20 ft. x 52 ft. x 20 ft.) at the apex. The principle function of this enclosure is for the display of butterflies. Other species of birds are also housed there including Rufous-tailed Hummingbirds and Purple-collared Woodstars. Supplemental lighting was installed for these nectar eating birds to allow them sixteen hours of daylight, throughout the year, in which to feed.

On 26th March 1989 an egg was found and removed. The egg was placed under a pair of Homing Pigeons which were to be used as surrogate parents for the incubation process and initial rearing of the squab. This technique had been used successfully here in the rearing of Nicobar Pigeons, *Caloenas nicobarica*. When it was two days old the squab was rejected by the foster parents and transferred to an incubator. The squab weighed 19 g and was started on a diet of 4 parts chicken baby food, 2 parts Hi-pro cereal, 2 parts water and 1 part apple pulp. The squab lived for twelve days when it died from an infection. Two other eggs were subsequently artificially incubated and the squabs hand reared. Hand-rearing protocols set up by San Diego Zoo (Kuehler, 1989) which had been

successful with Green-naped Pheasant Pigeons and with other pigeons and doves were used for the two squabs. Both died from separate causes; vitamin E deficiency and infection. With our lack of hand-rearing success, other eggs were left with the adults for them to incubate and rear the young but after each successful hatching the squab was found dead within a few days.

On 18th December 1989 an egg was discovered on a well planted ledge running along the public walkway. The ledge was 2 m. high and 45 cm wide (6 ft. 6 in x 1 ft. 6 in). The egg hatched on 14th January 1990 and the squab was later found to be a male by chromosome sexing. On the hatching of the squab the display was closed to the public and the small bird flourished.



*D. Oehler*

Five day old White-naped Pheasant Pigeon squab.

Further observations of the pair were made as other eggs were laid and squabs cared for. Displays were best seen in the morning hours. One bird, presumably the male, was often observed perched above the female. There he would *coo*, a call that could be heard well outside the building, until he flew down towards the female. A pursuit would then commence with what could be best described as a trot. While following the female the male's head and tail would oscillate vigorously. One dramatic display occurred three days before the production of an egg. A low resonating call, was noted from the pair and the birds clasped beaks and "bobbed" their heads up and down. The pair then separated leaving the female to stoop down on the ground. The male then walked closely around the female. While completing his circuit he turned slightly to the side and

vibrated the outstretched wing closest to his crouched partner. The circling bird's posture remained dominate while his tail pumped up and down at an accelerated rate (Creamer & Filbrun, 1991). Nestbuilding commenced approximately one week before the single egg was laid. A small scrape loosely lined with small twigs made up the nest. The eggs were glossy white with a mean measurement of 4.4 cm long and 3.1 c. wide ( $1\frac{3}{4} \times 1\frac{1}{4}$ ). Incubation of the egg lasted for approximately 26 days. When the nest site was disturbed a guttural roar, which was surprisingly loud, would accompany the normal pigeon-like wing beatings. The squabs left the nest at roughly 30 days of age when they would find a secure area under foliage. All young birds were removed when they were 42 days old in order to prevent their being injured and to allow further breeding by the adults. To combat vitamin E and calcium deficiencies found in developing offspring, Nekton-E and Nekton-MSA were added to the normal regimen of supplements placed in the fruit mix.

With secure, well-planted, undisturbed accommodation, an artificially controlled photoperiod and closely monitored vitamin intake, the White-naped Pheasant Pigeon has bred successfully at the Cincinnati Zoo. At the time of writing, the last four eggs and subsequent squabs have been taken care of to the time of fledging by the adult pair. Future success with additional pairs held here and in other aviaries may help to ensure the population in captivity.

#### Acknowledgement

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#### REFERENCES

- Beehler, Bruce M., Pratt, Thane K. & Zimmerman, Dale A. 1986  
Pheasant Pigeon: p.104, *Birds of New Guinea*. Princeton University Press.
- Black, A.R. 1930. Breeding the Green-naped Pheasant Pigeon in California.  
*Avicultural Magazine* 8, Fourth Series 6:158-160.
- Creamer, Karen & Filbrun, Jenny 1991. Cincinnati Zoo, Insect World,  
Personal communication.
- Glenny, Fred H. & Amadon, Dean 1955. Remarks on the Pigeon, *Otidiphaps nobilis* Gould.  
*Auk* 72: 199-203
- Goodwin, Derek 1982. Pheasant Pigeon, p. 238-239, *Pigeons and Doves of the World*.  
Cornell University Press.
- Hall, Lynn 1987. Pheasant Pigeons, p. 8-9, *Game Bird Breeders, Aviculturist, Zoologist  
and conservationist's GAZETTE*, July-August 1987.
- Kuehler, Cynthia 1989. Artificial Incubation and Hand-rearing of Pigeons and Doves.  
1989 AAZPA Regional Proceedings.

## JURONG BIRDPARK IN SINGAPORE

By Richard Perron  
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On a recent field-trip to south-east Asia I had the opportunity to visit the Jurong Birdpark in Singapore. The economic dynamism which characterises this Asian city is nowhere more obvious than at Jurong. Massive private capital investment, to co-incide with the twentieth anniversary, has been directed not just into the infrastructure to service the visitors (like the spectacular monorail public transportation system which will be 1.7 Km long when finished), but also into expansive, intelligently designed aviaries reflecting species-specific requirements. Half an hour from the city centre, in twenty hectares studded with lush tropical vegetation, the park houses more than 4,500 birds representing 420 species from all around the world. Jurong also employs a full-time horticulturist to exploit the full possibilities of the natural environment and climate and several endemic species of honeyeater are attracted to the nectar bearing blooms maintained in the park and some species of wild wetlandbirds, like the White-breasted Waterhen, live off the vegetation on the artificial lakes. This intelligent use of natural advantages in encouraging wild birds to entertain the visitor conceals the fact that few of the smaller species, typical of the tropical Asian forest, are on show in the park. The aviaries, both individual and multiple-species, are organised into twenty four core units highlighting habitat usage, behavioural congruence or family relationships. Unfortunately, because of renovations for the anniversary celebrations, the enormous two hectare walk-in aviary, with an artificial thirty foot waterfall, was closed during my visit, but promises to be the largest and most elaborate in the world. For the less athletic, the entire park can be traversed in comfort using the Tram Tour. This one mile journey covers the major attractions with frequent stopping points and a running commentary reminiscent of Disney World. My preference, despite the exhausting heat and humidity, was to make the longer walking tour which enabled me to view everything at my own pace.

There is a strong accent on visitor participation and inter-action throughout the park and not just for the children, although they are especially catered for: this includes direct contact with various species in the many daily bird shows and at the restaurants, at the special photographic points or through one of the fixed audio-visual exhibits. Despite the information booth in the park, the giftshop and postcard rack in the Administration building and the usual, timewarped, miniature notice

outside each cage for the species on display, the depth of species information is quite inadequate to satisfy the modern curious visitor and compares poorly with the total financial investment and the general quality of the presentation. Something on the line of Chester Zoo's "Zoo Labels" would add that extra polish as well as fill the educational void.

As in almost every bird park the world over, one of the most colourful, and popular, groups in Jurong is the "Parrot Parade", containing a varied selection of Cockatoos, Macaws and other, smaller parrots, focusing on those endemic to the Australasian region, but covering all the continents. I was particularly pleased not to see any parrot hybrids, which are becoming a regular feature in many European birdparks. Although only the male was on view to the public at that moment, the park has a breeding pair of the seriously endangered Hyacinth Macaws among it's South American parrots and has regularly produced offspring. Success with breeding parrots has made Jurong famous throughout Asia and Australasia, and their expertise is often utilised by other zoos and birdparks to support their local breeding programmes.

The nearby World of Darkness, with suitably darkened habitats, contains seven types of owls - including *Ketupa zeylonensis* and *Ketupa ketupu* - alongside the more unusual nocturnal Brown Kiwi (also a breeding success story), Tawny Frogmouth and one lonely Bush Curlew. On the other side of the main entrance building several species of penguins, including Humboldt, Little, and King occupy an enclosure with a swimming pool separated from the public by viewing glass so that the movements of the birds can be followed above and below water. The Humboldt Penguins have been breeding successfully here since 1976 and at the appropriate time the mating rituals and territorial displays can be seen by the visitor.

For most ornithologists, Jurong has something of special interest to offer, whether it is the birds of the wetlands, birds of prey or Birds of Paradise. Although by no means the world's largest, the selection is impressive and the habitat reconstruction successful, mainly because the concentration is on Asian, or neo-tropical, species. The Argus Pheasant, Malay Crested Fireback, Brahminy Kite, White-bellied Sea Eagle or the strange Roulroul are all at home here. Broadbills, Woodpeckers, Pittas, Crowned Pigeons, Bulbuls, Mynahs, Shamas, Magpie Robins and glittering Sunbirds all waylay the visitor with their beauty and charm. Numerous species of cranes and flamingos, tree-ducks and pelicans, swans and plovers inhabit large artificial lakes created especially for them and seem very happy, but my personal "Oscars" went to the Hornbill and Ratite displays. Both groups are the most comprehensive that I have ever seen anywhere.

The seventeen Hornbill species, of which the only African representatives are the Red-billed Hornbill and Southern Ground Hornbill, with their high, roomy cages, are certainly among the most extensive and well housed in the world. Although improvements in the foliage density of the upper canopy remain one of the curator's objectives, the present situation in no way detracts from the splendid cages and their fascinating inhabitants which include the very rare Helmeted Hornbill, the Black Hornbill, the Tarric Hornbill, the Great Hornbill and an unusual chance to see three sub-species of the Rhinoceros Hornbill at close range.

Ratites, birds with a flat breastbone which are often flightless, are my speciality, and the reason for my visit to the area, so I was particularly pleased to find Jurong has most of the world's larger species. In no other zoo, as far as I am aware, anywhere in the world, is it possible to see an Ostrich, an Emu, a Double-wattled Cassowary, a Dwarf Cassowary, a Single-wattled Cassowary, a Greater Rhea and a Lesser Rhea in neighbouring pens for easy identification and comparison. Unfortunately, although the three cassowary species had been given plenty of shady, green foliage to imitate their forest habitat, I felt a bit sorry for the grassland birds which had, understandably, grazed their pens, despite being generously sized, into dust.

Singapore has become known as the "Bird Market of the world", and most rare species can be obtained if the price is right. The city, occupying a very favourable geographical position, receives birds from all of the neighbouring countries, and many further afield, even though much of the trade is forbidden under the Washington Convention (CITES) and the national laws. Ken de la Motte, the Consultant Curator in Jurong, informed me that the Birdpark has increasingly assumed a conservationist role in south-east Asia and has rescued many rare species from unscrupulous dealers who have little concern for the well being of the birds. Recently, the New Zealand authorities intercepted a large smuggled quantity of fertile parrot eggs from America and passed them on to Jurong for successful incubation. I saw about forty very young fledglings, ranging from macaws to amazons, being hand fed. The principle, that birds bred in captivity reduce the economic pressure for the capture of wild birds, has inspired Jurong. The breeding of rare species, to exchange with other zoos, has become a speciality of the Birdpark and they devote a lot of time and effort into achieving their very considerable successes.

## BREEDING THE RED-SPOTTED LORIKEET

By Dulcie Cooke  
(Epsom)

The Red-spotted or, as it is sometimes called, Red-marked Lorikeet *Charmosyna rubronotata rubronotata* is a member of that most delightful of all Lory and Lorikeet genera, *Charmosyna*. If more Aviculturists who keep Lories and Lorikeets knew of the very special charm of these little birds they would surely make strenuous efforts to obtain them.

In their native areas, which include the islands of Salawati and Biak, Irian Jaya New Guinea and North Western Papua New Guinea, these beautiful little birds are sparsely distributed in forest land up to 900 m, tending to be more scarce in lowland areas. In their habitat they have to contend for food with the Red-flanked Lorikeet, *C. placentis* and the Fairy Lorikeet, *C. pulchella*. Red-spotted Lorikeets have usually been seen in small flocks feeding in the higher branches of flowering trees which include Coconut Palms growing in coastal areas. When searching for food they fly swiftly above the tall trees on which they feed. Like other members of the *Charmosyna* genus their food consists of nectar, pollen, blossoms and possibly soft fruits. In their native haunts they are considered to be quiet birds but in a domesticated situation they have a tiny but charming little warble.

The male of the nominate race may be described as follows. The nape of the neck, mantle and back are dark green, the wings very dark green. The crown and forehead are very bright red and the cheeks are light green. The ear patch is not as extensive as that of the Red-flanked Lorikeet but nevertheless is a most attractive feature of the bird, being a deep purple. The pretty "apple" green of the breast is suffused with yellow at the sides and the brilliant red high up on either side of the breast is an extension of the under wing colour. The tail is dark green above and yellow below and some of the tail feathers are prettily marked with yellow and have a red base. There is a fairly dark red band running across the rump and blending into the under wing red which makes the bird look very attractive in flight. The large eyes are orange, the beak is red and the legs are a rather washed out red. Some cocks are said to exhibit yellow in the under wing feathers. The female of these sexually dimorphic birds is a most elegant little beauty. The forehead, crown, nape, and mantle are all dark green, as also are the wings and back. The breast is light "apple" green with a pronounced golden yellow suffusion at the sides of the breast. The cheeks are a very bright light green and the ear patches are light green streaked

with gold. The tail is dark green above and yellow below. There is a dull red patch on the rump. The eyes are orange, the beak red and the legs a dull rather light red. The weight of these birds is probably about three quarters of an ounce and the total length is about 6 ½ in. (approx. 16 cm).

There is a sub-species, *C. r. kordona* which is apparently found only on the island of Biak. In this race the male has a larger area of red on the crown which is paler in colour and the ear patch is blue instead of purple. The hen is similar to the female of the nominate race. In the case of the nominate race it is possible to sex the young in the nest, the cocks showing red on their heads as the feathers appear. The purple ear patch comes much later, long after they have left the nest.

Early in the summer of 1990 an opportunity occurred to obtain a pair of the nominate race from Shirley Lawton's collection. They appeared to be quite young and were in superb condition. My husband Freddie and I have a small indoor birdroom in our home which is lighted by Tru-lite for about 15 hours daily and ordinary warm light for a further 2 - 3 hours. The temperature is maintained throughout the year at a steady 74 °F. This very small room faces south and so there is plenty of natural sunlight. Plants are grown on the window-shelf to increase humidity and to make the surroundings attractive for the birds and for ourselves. We put the new arrivals into an aviary-cage facing southeast and measuring approximately 5 ft. x 2 ½ ft. x 3 ft. high (1.5 m. x 76 cm x 92 cm). Soon after their introduction to the room we added a nest box 5 ½ in x 5 ½ in x 8 in deep (14 cm x 14 cm x 20 cm). This was to prove a disaster. What we did not know at that time was that these birds, even when just roosting in their box, regularly drench it so that it really is necessary to have a bigger box for ease of cleaning and removing the wood shavings which comprise the nesting material.

Early in January 1991 the pair went to nest and two eggs were laid, one was clear, one fertile, but the chick died before hatching. The hen was at that time still very nervous and until she finally left the nest it was not possible to look inside. It was like a bog. The duties of incubating the eggs had been shared between the pair, the cock sitting during the day, the hen at night, and as soon as either of us entered the room the hen would dive into the nest. With this experience gained we took out the small nest box and replaced it with a larger one 7 ½ in x 7 ½ in x 12 in deep (19 cm x 19 cm x 30 cm) with a flat roof which we find all birds appreciate because they can sit on the top of the box with ease. About 4 in (10 cm) of soft wood shavings were put in the box and the birds took to this larger nesting site immediately. The larger size made it much easier to keep clean. On 24th February 1991 two eggs were seen in the box and this time the birds were sufficiently confident to allow me to clean out the box which they seemed

to appreciate very much. One chick hatched on 16th March and by the 20th two chicks were doing well. They had probably taken 21 days to hatch. On and after the 21st March the nest was cleaned out daily and the soiled wood shavings were replaced with new warm shavings which had been well rubbed to prevent any sharp "spikes" from injuring the really tiny chicks. Both birds were model parents sharing brooding, feeding etc. at all times. By this time the cock had become very confident and was almost tame. At four and five days of age the tiny babies stretched and flapped their wings in pleasure at the process of cleaning and being placed on dry warm wood shavings. They were fat and well fed and about the size of a Bee.

The food the parents were given is prepared as follows: cooked brown rice and bananas are liquidised, two tablespoons of rice to two medium sized peeled bananas in enough water to make a liquid mix. Peeled carrots are liquidised in a similar way. Sweet apples are also liquidised in a little water. To make one pint : one tablespoon of rice and banana mix, one tablespoon of apple mix, one teaspoon (after five days ) of carrot mix, one half level teaspoon (after five days) of ground soya bean flour (from Health food shops). To this is added half a level tablespoon of Muscavado medium brøwn sugar, half a level tablespoon of glucose, one level teaspoon of Australian honey (no other honey is used) and one tablespoon of a fruit based baby food which does not contain coconut (which is too indigestible for tiny babies) and is not based on citrus fruit for we have found that anything containing orange, lemon or grapefruit is not suitable for baby "*Charmosynas*" To the above mixture we add either one teaspoon of condensed milk, or the same quantity of Vita Food, which is a skimmed milk based product of Boots plc. This is an excellent addition for all Lories and Lorikeets which contains many vitamins, minerals, 21% protein and only 3 ½ % lactose. All the above are mixed first with cold then hot water to make up the whole volume to one pint. Into each small feed cup is put a piece of plain sponge cake about the size of two sugar cubes and the slightly warm mixture is then added.

Normally the birds are fed twice per day, using clean cups each time, but when feeding young the little cup may need "topping up" on several occasions, and it must be remembered that in thundery weather this food may go sour quite quickly. The 25 watt warm light goes on at 6 am., the Tru-lite at 7.30 am. and this remains on all day until 11 pm., when the warm light goes on for about one hour. It is quite usual to hear the babies being fed at 12 midnight and at 3 or 4 am. A dry food mixture consisting of one part ground rice, two parts fruit based baby food, one part glucose, half a part of bran and a quarter part of granulated sugar is always available in a small bowl on the floor of the aviary next to a bowl of water. This is

hardly ever touched but on one occasion when a minor accident prevented me from feeding the birds their nectar at the usual time the clever little parents switched to the dry food to feed their babies.

Both chicks of this second nest proved to be cocks. They left the nest together on the 7th May 1991, seven weeks after hatching, and three days later they were seen feeding from the nectar cup. They were strong flyers and good escapers! About the 20th May the hen appeared rather "puffed up" and disappeared for some time, on the 23rd May one of the young cocks was seen pecking his devoted little mother and so both were removed to another aviary-cage of similar size to that occupied by their parents. A nest box of similar size had been fitted and supplied with wood shavings. The young cocks made themselves at home immediately, feeding from the nectar supplied, eating bits of flowers, green food and playing on the small twigs and branches of apple supplied. They even copied their parents and had a bath in the rather flat bowl of water provided. They went to roost in the nest box the very first night. As soon as the young cocks were removed I looked into the parent's nest box and found one rather battered looking egg. The box was cleaned out and new wood shavings were provided. Nothing more happened for some time although the hen spent some period of each day in the nest. Early in June I looked into the box again and found three eggs. These were candled. The original one was clear and the other two were fertile. On the 18th June one chick hatched, followed on the 20th by the second.

The parent birds had now come to expect a daily cleaning of the nest when chicks were in residence. This is always a nerve racking experience when the babies concerned are just hatched and about  $\frac{1}{4}$  in. in length. In the early stages both parents remain at the other end of the aviary, but as the chicks grow the cock comes progressively closer during the process of cleaning, until he is on the outside perch of the nest box looking in and making "stabs" at my hand! Nevertheless the process is well tolerated by the parents who always give a lift of the wing to show their appreciation of this care bestowed upon their young. It is indeed an essential task for without this daily cleaning and removal of soaked wood shavings the box would be so wet that it is doubtful if the young would survive for long.

It is interesting that, at times when some of the nesting material was not removed and renewed, such as when egg laying was taking place, the cock could be heard vainly trying to gnaw the wood of the box. He did, in fact, succeed in making a little heap of chips at one time when the box had become really sodden and the birds had endeavoured to move their eggs into one corner near this little pile. Perhaps in the wild state in cavities of trees it is relatively easy for the birds to chip away porous wood to soak up the moisture.

These Lorikeets are always supplied daily with a tiny quantity of greenfood, usually endive, and whatever harmless flowers are in season. These include heather and indoor fuchsias in the winter, forget-me-nots and wallflowers in the Spring and roses, wild honeysuckle (not the flowers of evergreen honeysuckle which is a poisonous plant), impatiens (Busy Lizzies), outdoor fuchsias, white alyssum, pansies and *Begonia Semperflores* (the small bedding begonia which is a great favourite with all Lorikeets) at other times of the year. It should be noted that the beautiful sweet scented *Daphne Mezereum* is a poisonous plant and that every part of the Rhododendron flower is poisonous. Honey coming from an area where these shrubs grow in abundance should be avoided. I find Australian honey the best for small birds.

Like most Lorikeets Red-spotted enjoy small twigs and little branches of hazel nut and apple with the leaves removed and the buds left in place. They will eat these and also the bark with great pleasure. Our two young cocks have a small branch of either of the above at least once per week. One end of their little aviary now looks like a little "jungle" and they enormously enjoy climbing and playing amongst the twigs and branches.



*Dulcie Cooke*

#### Red-spotted Lorikeet

It may be noticed that the quantity of soya bean flour I include in the food is tiny. This very excellent substance is very high in protein, about 38 to 40 % of the whole flour. Birds need protein to breed, grow etc., but only in very limited amounts. Probably somewhere around 15 to 16 % of the whole of their food. Too much protein may produce eggs etc. but the end result will be damaged kidneys and liver leading possibly to the bird's

death. I have noticed that members of the *Charmosyna* genus are particularly sensitive to soya and Stella's particularly produce heavy, thick and pasty excreta when given too much soya. The tell tale over-rounded look below the vent (as if there were an egg about to be laid), seen in both cocks and hens, is a sign of an "overloaded" liver. It is a sign to be ignored at the owner's peril. If it occurs it is advisable to reduce the viscosity of the nectar by adding a little more liquidised apple and to stop the soya.

Owing to the fact that these birds are only in the care of a limited number of Aviculturists in different parts of the world, breeding successes are few and far between, and probably not always recorded. Rosemary Low states in *Parrots, their Care and Breeding* that in 1981 Helmut Michi in West Germany bred two chicks but they died at 16 and 17 days of age. I can find no records of these birds having been kept and bred in the USA. In 1990 Andrew Blythe and Johnathan Powell bred three *C. rubronotata* and I understand that Roger Bulloss bred one bird in the same year. My husband's and my breeding results are: two completely independent cocks hatched in March 1991 and two strong chicks three weeks old at the time of writing, which is July 1991. All the above are parent reared birds. It is very much to be hoped that any other breedings that have taken place, or which occur in the future will be reported.

In conclusion, I consider that once they are thoroughly established and used to their home the Red-spotted is one of the most charming of all tiny Lorikeets. Their little aviary-cage remains surprisingly clean, they keep their feathers immaculate and always gleaming and they are the most attentive and tolerant parents imaginable. Clearly they are suitable only for indoor heated quarters but they make a most delightful addition to any collection of small Lorikeets and their obvious willingness to reproduce their kind recommends them to all Aviculturists keeping the more delicate members of the *Loriinae*.

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**NOTES FROM THE INTERNATIONAL  
ORNITHOLOGICAL CONGRESS  
CHRISTCHURCH, NEW ZEALAND**

By Roger Wilkinson  
(Curator of Birds, Chester Zoo.)

The 20th International Ornithological Congress held at Christchurch, New Zealand, from 2nd - 9th December 1990 was a mammoth meeting attended by some 1200 delegates from around the world. The programme and abstracts alone were presented as a 550 page volume and the proceedings are yet to follow in a further three volumes. The meeting was extremely useful.

It was impossible to attend all the sessions as up to ten were run concurrently. Obviously captive breeding and conservation took priority for me but when these were not running I was able to attend sessions on co-operative breeding, mate-choice etc., which also had relevance to captive propagation. The plenary lectures were most stimulating. One on gas exchange in embryos at high altitudes was directly relevant to the problems we have had in artificially incubating Kea eggs. Enrique Boucher gave a plenary lecture on applied ornithology which particularly addressed the problem of the export of Blue-fronted Amazons from Argentina. John Craig's plenary on communal breeding across the changing face of theory was not only challenging but immensely entertaining. John Croxall gave his plenary on ecological and physiological constraints on reproduction in Albatrosses - a title which did not do justice to its content. The Japanese Blue Fin Tuna industry is currently threatening Albatrosses with extinction. An estimated four and a half million Albatrosses become the victims of the long-line Tuna industry each year and the reduced survival rate of juveniles and adults has resulted in an overall decline in Albatross populations over the last fifteen years. Charles Sibley presented his revised avian taxonomy based on DNA hybridization studies. Ratites were shown to be monophyletic; Toucans to be advanced Barbets, Vireos (but not Starlings) to be related to Crows and New Zealand Wrens to be different from everything else in the world!

I attended three round-tables. One on avian disease was particularly concerned with the impact that disease could have for reintroduction programmes. The second on species level taxonomy promised to be of interest with regard to current problems Zoos are having in coping with subspecies. In the event it did not really help our decision making other than noting that the US constitution notes the importance of conservation



*Roger Wilkinson*

Kokako at Mount Bruce National Wildlife Centre,  
New Zealand.

of endangered species, subspecies (and populations?). The number of taxa needing help is ever-widened and the recent Red Data Book policy of considering only species (and not sub-species which a future taxonomic revision could upgrade to species level) may be too narrow. The newly favoured phylogenetic species concept may gradually replace the biological species concept. If that happens we can expect a large number of taxa previously ranked as subspecies to be elevated to specific level.

The third round table on captive breeding was specifically convened to consider its role in the conservation of New Zealand birds. A brief introduction established that captive breeding of Takahe began in 1959 and was divided between two facilities: Burwood Bush close to the release area and Mt. Bruce National Wildlife Centre. Sophisticated techniques included the use of a fibreglass Takahe model complete with heat-pad and loudspeaker. One-way glass rearing booths and puppets were also used. The use of puppets was challenged by Ellen Thaler (Curator of Birds at Alpen Zoo) who preferred birds to be hand-reared but kept in visual contact with a tamed member of their own species. Discussion indicated this method had been successful with Choughs, New Zealand Falcons and Pukeko. However, under stressed conditions birds reared in contact with humans may seek human habitation, e.g. bustards in Saudi Arabia showed no tameness when released but under conditions of drought or food shortage returned to human areas looking for food. Black Stilts were the next bird to be discussed. Experiments with the reintroduction of hand-reared Black Stilts and those fostered under Pied Stilts had little success. Black Stilts were now being parent-reared at Twizel in large natural enclosures in the wild range of the species.

One representative argued strongly against captive breeding suggesting that instead all effort should be concentrated on in situ conservation. He then went on to praise the New Zealand transfer and cross-fostering management techniques as infinitely preferable to caging birds. This emotive argument was ably countered by Don Merton replying that in fact small islands were very like large aviaries and his techniques very similar to those of captive breeding. I also had my say again arguing for the integration of captive breeding with conservation in the wild. Environmentalists should not be afraid of the success of captive breeding diverting people from the goal of preserving species in the wild, captive breeding being a step to the same end.

Discussion followed for and against the argument of captive breeding as an insurance policy for the over 1,000 bird species now considered threatened. Other techniques considered included behavioural manipulation of the endangered species; for example training Peregrines to nest on city blocks, and training Saddlebacks to use elevated rat-proof roosting

boxes. An argument was made that Blue Ducks could be trained to frequent areas of still water thus giving them a larger range of habitats. The response was that this change would be counterproductive as the Blue Duck was specifically a bird of mountain streams. The counter argument that in historical times Blue Ducks may have occupied more general habitats echoed an argument in an earlier session that we may be wrong in assuming that what birds are doing now is optimal; e.g. Takahē in alpine New Zealand are considered now to be occupying a sub-optimal habitat as are Ne-ne in the upland areas of Hawaii.

A captive breeding symposium preceding the round table included papers on the prospects and problems of reintroducing captive bred birds with examples from, Whooping Cranes, Guam Rails, Condors and Shorebirds. Other related papers were scattered through many different symposia. I will briefly review some of the most relevant of those I attended.

Scott Derrickson, Curator of Birds at the National Zoo, Smithsonian, USA, considered the problems of reintroduction. He argued for the use of manipulative techniques by Conservation managers on wild populations to avoid having to use captive breeding as a last ditch solution. However, he stressed that for some species long term propagation ex-situ may be the only hope for future survival. Contrary to every other report I have read he argued that for 544 different releases considered there was no significant difference between the success of hard or soft release techniques. The strategy for establishing a captive population was to a) Secure a large founder population, b) Expand quickly to carrying capacity, c) Minimize inbreeding, d) Equalize founder representation, e) Maintain stable age distribution, and f) Avoid artificial selection.

Various examples were discussed including Lord Howe Island Woodhen, Thick-billed Parrots, Whooping Cranes, and Hawaiian Geese. The Californian Condor project was estimated to be costing US \$500,000 a year, and the Puerto Rican Parrot Project was also very expensive. Of thirteen captive-bred microchipped Bali Mynahs recently released into the wild, one had already turned up in Jakarta bird market! Unless capture for the pet trade can be stopped this project cannot be viable.

David Ellis reviewed the history of Whooping Crane captive-breeding and reintroduction in the USA. Cross fostering of Whooping Cranes to Sandhill Cranes at Gregs Lake has now been phased out and considered to have been unsuccessful. Problems included mal-imprinting, powerline strikes and avian tuberculosis. The main problem was of sexual imprinting to the foster Sandhills. Of thirteen birds presently in the flock it is not expected that any will ever reproduce successfully. Now it is intended that juvenile captive-bred Whooping Cranes should be reintroduced instead of

cross-fostering. However, an experiment with Sandhill Cranes resulted in total failure as pre-release conditions had not been correctly defined. Parent-reared cranes were found to be the best for release.

Susan Haig reported on her computer simulation to consider the best genetic options for choosing which Guam Rails to use for an introduction to snake-free Rota island (Guam is no longer suitable because of Brown Tree Snakes). David Bird read M.P. Wallace's paper on the Californian Condor programme. Interesting points were that copulation is socially facilitated - one pair mating in vision of a second pair leads to copying and that the programme is going better than expected; the Andean Condor surrogates adapting well to the release programme. A change in strategy is that the Andean Condors (all females) will be left in the wild for an overlap period to research the Californian foraging sites etc.

In a different session, Christine Reed reported on problems resulting from cross-fostering Black Stilts; cross-fostered Stilts tended to migrate with the Pied Stilts rather than remaining in the Mackenzie basin with the sedentary Black Stilts. Black Stilts are now critically endangered with interbreeding between them and Pied Stilts and only 80 remain.

John Innes reported how the main threat to the New Zealand avifauna had come from introduced species. The Kakapo situation is well known but I was surprised to find the Kaka now declining on the mainland with only one nest found to be successful on South Island in the last six years. (That I found a pair south of Lewis Pass thus pleased me greatly!) Other declining species included Kakariki, Yellow-heads and Kokako. Control of competition by poisoning was discussed with respect to Possums which defoliate native forests.

John Craig once again challenged current theory arguing that the 1980's genetic theories for population management were not appropriate for New Zealand birds. In particular the Population Viability Analysis (P.V.A.) assumptions that a) Selection is less important than drift, b) Inbreeding of more than 1 - 3% is deleterious and c) Animals mate randomly as applied to New Zealand birds is contrary to experience. Craig considered that many small populations rather than one large one were better genetically and stochastically. He argued for a minimum of three populations each with a minimum of ten pairs rather than the single population of 500 birds as being argued for by P.V.A. theorists. Craig also advocated minimal management with no inter-island transfers, and no attempts to equalize founder contributions as these would impede local adaptation.

Important points that came up in discussion were that in Red-billed Gulls there is no correlation between good breeders in one generation and those in the next generation. Thus there is no justification for selecting

good breeders as founders. Secondly out-breeding depression may occur if founders are selected from different populations. Thus it may not be wise to pair together birds originating from different areas.



*Roger Wilkinson*

Takahē at Mount Bruce National Wildlife Centre, New Zealand.

In a symposium on disease ecology and the conservation of avian species we learned that viruses are expected to become a greater problem in the face of global warming. It was argued that most wild birds no longer live in a natural environment and that some intervention may be needed which should be targeted on the host, agent, or environment. For example scaring waterfowl away from sites where cholera has been identified. Milton Friend emphasized the need for the results of autopsies to be databased. Problems of disease and reintroduction were highlighted by the transfer of avian tuberculosis to free-flying Whooping Cranes. Other concerns were neoplasia in Sandhill Cranes, and Avian Pox and Malaria in Hawaiian birds. Avian botulism was seen as a disease of disturbed and managed wetlands. In captive populations herpes virus was particularly worrying having been responsible for many crane deaths. Eastern equine encephalitis was now causing concern by also causing the death of captive cranes.

A separate symposium was devoted to pain and stress in birds. Alan Feduccia's paper on skeletal pathology of birds in Zoos was based on his research on post-mortem material. Feduccia used this as a vehicle for

"Zoo-bashing". He argued that birds in Zoos were subject to a great deal of pain and suffering especially ratites which suffer pathological lesions and chronic osteoarthritis. Rather than arguing a case for improved keeping conditions with larger areas for exercise he used this to argue that Ratites should not be kept in captivity. Clearly stress in captive birds is a problem and that was why I attended that session. Other papers indicated how stress affects birds and its main causes. Handling and transport were the most significant causes of stress. Other important stressors that led to disease problems included surgery, temperature, pathogens, noise, social interactions, and feeding restrictions. For chickens the strongest stressor was the human presence. Machine caught birds were less stressed than those caught by people. I do not advocate our using machines but handling should clearly be minimized. That creates problems as we need to handle birds for management purposes including worming and the checking of identification rings or other markings.

Whilst in New Zealand I took the opportunity to visit the excellent Mount Bruce National Wildlife Centre. Concurrently managed by the Department of Conservation the National Wildlife Centre evolved from the Mount Bruce Native Bird Reserve. It began when the Internal Affairs Department bought up the land and aviaries belonging to Elwin Welch, a farmer and aviculturist who worked with Takahe from 1948. Mount Bruce now breeds and exhibit a large number of native species including Takahe, Blue Duck, Kokako, Saddlebacks and Kiwi. As always smaller aviaries of earlier years remained as a testimony to how our criteria for cage design has advanced faster than the financial abilities to rebuild aviaries. The newer aviaries are excellent; extremely spacious and worthy of their endangered occupants. The nocturnal house was especially good with extremely large spacious well planted natural areas for the Kiwis. Mount Bruce is open to the public and set in a remnant of native forest which is home to many wild native birds including my personal favourite the Tui. New Zealand is indeed fortunate in having dedicated people with far-sighted attitudes which enable them to devise strategies to conserve their fascinating but sadly depleted avifauna and to remain very much at the cutting edge of bird conservation. I applaud their work and especially wish them success with that most marvellous of parrots, the Kakapo.

## THE PRESIDENT'S GARDEN PARTY

On Sunday 2nd June 1991 over one hundred members and their guests gathered at Chestnut Lodge, Cobham, Surrey, at the kind invitation of Miss Ruth Ezra and Raymond Sawyer (President and Vice-President respectively of the Avicultural Society). The weather was colder than usual with no sunshine but, fortunately, it did not rain.

As always this world famous collection had some interesting new arrivals. A pair of Little Bee-Eaters were most striking, as were a single Carmine Bee-Eater and three Blue-faced Honeyeaters. A single Golden-headed Quetzal refused to come outside, preferring to sit eyeing us from its stone-built shelter. Perhaps my favourite new arrivals were a pair of Laminated Hill Toucans with their wonderful coloured bills. Old favourites were still present and included what must be the only male Scarlet Cock-of-the-Rock in the country. It is 15 years since it first came to Cobham. The Toco Toucans looked magnificent, as did a pair of Racket-tailed Rollers, the two cock Purple-throated Fruit Crows, the Grey-backed Trumpeters, Royal Starlings, Golden-heart Doves, Pygmy Geese, Roulroul Partridges and the waders, which included Avocets, Black-winged Stilts and Crocodile Birds. Amongst the parrots were Scarlet and Blue-and-Gold Macaws, Keas, Philippine Hanging Parrots, Red-flanked Lorikeets and, a new arrival, a Hyacinthine Macaw. Crowned and Demoiselle Cranes, Flamingos and a varied collection of waterfowl were at liberty in the grounds as usual. There is still a large selection of tortoises, including the Giant. The gardens are a delight and add much to the enjoyment of the occasion.

Tea was provided on the lawn and our hosts were thanked for their generous hospitality which included the £406 raised through the ticket sales and which they donated to the Society's funds. At tea, presentation of first-breeding medals were made to Jeffrey Trollope for the Blue-and-White Flycatcher and to Mr. and Mrs. Freddie Cooke for the Wallace's Lory.

Stewart Pyper

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## BREEDING THE AMETHYST STARLING

By Stewart Pyper  
(Frome)

The Amethyst Starling *Cinnyricinclus leucogaster* comes from Africa. Its range is from Kenya in the east to Senegal in the west with a subspecies *C.l.verreauxi* covering Kenya to Natal and west to Angola. It is often called the Violet-backed Starling in field guides. The bird is about 7" (177mm) long and pairs are visually sexable which is unusual in members of the Starling family. The adult male is a metallic violet plum colour above with a white belly and lower breast. The female has tawny brown upperparts, and dark-streaked white underparts. My two youngsters are similar to their mother but lighter in colour with gape markings still showing (November 1990).

The Amethyst Starling has long been known in aviculture, with the first breeding occurring in 1935 when Maurice Amsler was awarded the Society's medal (*Avicultural Magazine* November 1935 Fourth Series Vol.XIII 11: 295-300.) W. D. Cummings describes the breeding which took place in 1958 at the Keston Foreign Bird Farm (*Avicultural Magazine*, March/April 1959, 65, 2: 44-46.) The Cotswold Wildlife Park at Burford, Oxfordshire, and Harewood House, Near Leeds, bred them during the mid-1970s as is recorded in the Avicultural Society's Breeding Register. None have been recorded by the Foreign Bird Federation since it started its breeding register in 1984. Colour plates are to be found in the August 1908 and April 1921 issues of the *Avicultural Magazine*.

My first 'pair' of Amethyst Starlings was obtained in October 1970 but they were two cocks for I was not aware, at the time, of the marked sexual dimorphism which this species exhibits.

I acquired a pair on the 8th March 1979 at a time when they had become scarce in the United Kingdom. The cock died on 21st March but a replacement was obtained on the 22nd April. I am certain that my birds are West African, probably from Senegal, as a lovely colour plate by H. Gronwold showing both these two birds appears in Bannerman's *Birds of Tropical West Africa* Volume 6.

The pair has occupied three different aviaries but since 1982 they have been in the same enclosure the flight of which is built on an old rockery. The flight is 14 ft long x 7 1/2 ft wide x 7 ft high (4.5 m long x 2.42m wide x 2.25m high). It faces south and is fairly well exposed. A shed running along the back provides shelter from bad weather and is also used for feeding. At this end is a sheet of PVC, 2½ ft (0.8m) wide, on the aviary roof

and down the western side, and the far end is sheltered against strong winds. There is a hawthorn tree in the centre which is cut back each autumn as is a Russian vine which grows on the eastern side by the footpath, and provides cover in the breeding season. In 1990 the aviary housed 'pairs' of Amethyst Starling, Southern Tit Babblers, Yellow-collared Ixulus, Red-tailed Sivas, and Grosbeak Starlings and a cock Philippine Hanging Parrot.

During the previous two winters all the birds with the exception of the Babblers remained outside but before then the birds had been brought in from this aviary. The Amethyst Starlings had shown no real signs of breeding. Various shaped nestboxes had been put up and although some inspection had taken place, nothing had happened. This species, like its near relative the Emerald Starling, loves to pick off small leaves to carry around the flight.

In the spring of 1990 the cock bird chased the hen a little as he always did and displayed with a quiet call. He fanned out his wings and tail, but it seemed that the hen was not interested. A nestbox hung inside at an angle of 20° was chosen for her nest, (unknown to me). It contained wood shavings and rotten wood and was 15" x 9" x 5 ½" (38cm x 23cm x 13.75cm) There is a 2" (5cm) diameter hole at one end and a door at the other which can be used for inspection purposes. The nestbox, upon a full inspection when the young had left, revealed quite a few dead leaves but little else had been taken to the box. I did not know that the hen was sitting. Both birds were always in the flight during the summer although early June was cooler than other periods the previous year when, in Somerset, temperatures of over 90°F were recorded. Perhaps I should have realised that a part of a blue egg shell was not from the Grosbeak Starlings, which had nested occasionally for some time, usually throwing out their eggs or even laying them straight onto the aviary floor. The pair of Red-tailed Sivas had also nested and on Friday 22 June at 5.30 p.m. I saw a young bird, but by 9.00 p.m. it was missing. I found it the next day. It must have been two days old at the most. The weather was by now very hot and on Wednesday 27th June in the morning at 7.20 a.m. I saw the hen Amethyst Starling with two mealworms in her beak, being chased by the cock. During the day my father saw this as well. Again, it happened when I gave them the usual mealworms on my returning home from work. I went into the flight, looked into the nestbox and saw two youngsters but no sign of any eggs. The chicks were several days old. On the 28th June it rained in the afternoon and was not so hot. The supply of mealworms dusted with SA37 was increased and the birds were given waxmoth larvae. On Thursday 5th July I examined the nest again with a torch and all looked well with the chicks appearing as if they could leave the nest any day. I decided to

put a wire frame in the doorway of the shelter for three parts of its height in the hope that it would keep the youngsters inside for the first few days. Both birds were seen out of the nest at 1.15 p.m. on Saturday 7th July. On Sunday, the 8th, one bird was in the flight all day, the second was unable to fly very well but in the evening it had ventured outside. I could see it so I caught it and put it back inside the shelter. It spent all day on Monday 9th July inside, coming out to roost at night. This time I could not see it and it spent its first night outside. On Tuesday 10th July I could see both young birds in the flight all day and they roosted as near to the aviary roof as possible.

They were similar to their mother but the brown was lighter and their yellow gape markings were obvious for several months after. They were fed by their parents for as long as four weeks after leaving the nest but I believe this was partly because they were very lazy. They would call for food and their parents duly obliged.

Ants eggs and ants were available in the long hot summer of 1990 and they were taken. The Red-tailed Sivas in particular enjoyed this treat. The food available at all times was Orlux insectivorous food, bananas, grapes, apples, pears and oranges, some cut up and others spiked, mealworms and a nectar mixture made from honey and beef extract, brown sugar, Abidec drops, Milupa, glucose and Complian. The Amethyst Starlings took some of each. Other fruits were offered in season. It is said that these birds take dung into their nests. Accordingly horse manure and cow dung was put into the aviary each year. None was taken into the nest but it attracts plenty of live food which the smaller Babblers love to catch.

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## CHESTER ZOO NOTES - 1990

By Dr. Roger Wilkinson  
(Curator of Birds)

Chester Zoo has always maintained an interesting Parrot collection and in reviewing 1990 I would like to start by considering some of our experiences with the larger parrots.

Our Lilacine Amazons *amazona autumnalis lilacina* are wild caught birds presented by Customs and Excise to Chester in 1982. They had never shown any sign of being interested in each other let alone in breeding and so we decided that perhaps the time had come to admit our lack of success with this species and replace them with Green-cheeked Amazons *Amazona viridigenalis*. Consequently, in order to make up unrelated pairs, we imported two young Green-cheeks from Rotterdam Zoo and purchased a second sibling pair from Janet Fletcher, a private aviculturist who had considerable success with this species. The Lilacines then surprised us by laying eggs for the first time and thus securing their future with us. Although no chicks hatched this was very promising as was the first nesting of a pair of our Hawk-head Parrots *Deroptyus accipitrinus*. The Hawk-heads got one stage further than the Lilacines in actually hatching a chick although this died when it was a few days old. Our Leadbeaters Cockatoos *Cacatua leadbeateri* laid but incubated unsuccessfully their first clutch of eggs. We decided to remove the second clutch and these were taken as they were laid and removed for artificial incubation. Both eggs hatched and two chicks were hand-reared as were a Kea *Nestor notabilis* and a Blue-eyed Cockatoo *Cacatua ophthalmica*. A second Blue-eyed Cockatoo was reared by its parents; this was especially gratifying in that this was the first time this particular pair had attempted to breed. The male parent was a captive-bred bird hatched at Cleve Hill Birds Gardens in 1979 and the female parent had been hatched at Chester in 1983.

The Keas have been laying eggs for a number of years but failing to hatch any chicks. Hence their eggs were taken for artificial incubation. The eggs of high altitude Parrots such as Keas react differently from those of other Parrot species and a particular problem is getting them to lose sufficient water during incubation. In order to achieve the desired weight loss the eggs must be weighed at regular intervals and the humidity of the incubator adjusted accordingly. In order to hatch the eggs the incubator had to be run dry and silica gel employed to achieve the desired water loss. Red-sided Eclectus Parrots *Eclectus roratus polychlorus* hatched chicks

but we were unsuccessful in rearing these either under their parents or by hand-rearing.



Roger Wilkinson

Red-fronted Macaw bred at Chester Zoo in 1990.

Although when necessary we hand-rear parrots our ultimate aim is for the birds to rear their own youngsters. Our greatest successes this year were with the Red-fronted Macaws *Ara rubrogenys* which bred for the first time at Chester rearing a single youngster from their second clutch and with the Greater Vasa Parrots *Coracopsis vasa* which reared two chicks as previously first reported in this magazine. The Lesser Vasa Parrots *Coracopsis nigra* first bred in 1985 and these were again successful in rearing a brood of four chicks. The Blue and Yellow Macaws

*Ara ararauna* again reared two superb youngsters.

Other psittacine species bred included Lesser Patagonian Conures *Cyanoliseus patagonus*, Slender-billed Parrakeets *Enicognathus leptorhynchus*, Yellow-backed Chattering Lorys *Lorius garrulus flavopalliatu*s, Musk Lorikeets *Glossopsitta concinna*, Musschenbroeks Lorikeets *Neopsittacus musschenbroekii*, Derbyan Parrakeets *Psittacula derbiana* and Splendid Parrakeets *Neophema splendida*. New to the collection were Scarlet Macaws *Ara macao* and a pair of Blue-throated Conures *Pyrrhura cruentata*; the latter being an endangered species from the remnant Atlantic forests of Brazil.

Another group of birds with which we had particular success in 1990 was the pheasants. Sixteen Himalayan Monals *Lophophorus impeyanus*, thirteen Brown-eared Pheasant; *Crossoptilon mantchuricum* and two Satyr Tragopans *Tragopan satyra* were reared in addition to a number of commoner species. The rearing of Grey Peacock Pheasants *Polyplectron bicalcaratum* was of some interest in that one of the chicks was hatched and reared by an unpaired female. This bird had laid and was incubating its own infertile eggs at the time our breeding pair laid their first clutch. Her infertile eggs were then replaced by the fertile eggs from the pair and she proved a model parent. The breeding pair then went on to rear two chicks from a subsequent clutch. New to the collection were a pair of Temminck's Tragopans *Tragopan teminckii*. The Variable Chachalacas *Ortalis motmot* reared a fine chick in 1990 but no Bare-faced Curassows *Crax fasciolata* were bred.

Crowned Plovers *Vanellus coronatus*, Blacksmiths Plovers *Vanellus armatus*, Superb Spree Starlings *Spreo superbus* and Coletto Mynahs *Sarcops calvus* again reared chicks and the Kookaburras *Dacelo novaeguinae* had another successful year fledging six chicks.

Trumpeter Hornbills *Bycanistes bucinator* reared two chicks for the second year running and the Wrinkled Hornbills *Aceros corrugatus* nested for the first time but the female emerged alone without any indication of hatching success. Two Bar-tailed Cuckoo Doves *Macropygia unchall*, were reared. Two pairs of Pink Pigeons *Nesoenas mayeri* laid and two chicks were hatched after fostering their eggs to Java Doves *Streptopelia risoria* and Domestic Pigeons *Columba livia*. The Java Doves reared one chick to four weeks old but sadly that bird died before it reached independence. Rothschild's Mynah *Leucopsar rothschildi* also had a shaky year but one chick taken from the nest at a few days old was successfully hand-reared.

Our greatest success with an endangered species was the rearing of seven Waldrapp Ibis *Geronticus eremita*. Three chicks were hand-reared and four others resulted from supplementary feeding of the chicks under

their parents. The lack of breeding in 1990 of our flamingos was put down to the necessary disturbance because of major work required to complete the new flamingo shed and the extensive new enclosure around the Lemur Island. The Chilean Flamingos *Phoenicopterus chilensis* now occupy this new area leaving the Caribbean Flamingos *Phoenicopterus ruber ruber* to occupy the older area. We hope it will not be too many years before the birds settle down in their new situations.

We were also particularly gratified when the Channel-billed Toucans *Ramphastos vitellinus* repeated last years success in again fledging two youngsters. In 1989 the eggs of the Collared Aracaris *Pteroglossus torquatus* proved infertile and despite exchanging our male for a new bird again this year the eggs were infertile. New to the collection is a pair of Toco Toucans *Ramphastos toco* and recently on display, also for the first time in some years, a Sparkling Violetear Hummingbird *Colibri coruscans*.

Many species nested in the free-flight and the aviaries of the Tropical House. We were especially pleased to rear four Mountain Witch Doves *Geotrygon versicolor*. White-headed Buffalo Weavers *Dinemella dinemelli* and Golden-Palm Weavers *Ploceus bojeri* again fledged young. The Plumbeous Redstarts *Rhyacornis fuliginosus*, share their enclosure with the Congo Peafowl *Afropavo congensis*. The Redstarts nested and one chick was reared to independence but sadly died later in the year. Birds nesting in the free-flight area included White-rumped Shamas *Copsychus malabaricus*, Fairy Bluebirds *Irena puella* (one of which was hand-reared) and Java Sparrows *Padda oryzivora*. Emerald Starlings *Lamprocolius iris* hatched chicks but disappointingly failed to rear them. A major new development nearing completion in the Tropical House is the conversion of the old Gorilla inside enclosures to two massive new aviaries. These are currently being landscaped and will be planted to simulate a rain forest environment. One of these aviaries will house our Great Indian Hornbills *Buceros bicornis* and the other our Rhinoceros Hornbills *Buceros rhinoceros*.

Other recent developments on bird enclosures include the netting over of one of the crane paddocks and the building of two large new Snowy Owl enclosures. Two telegraph poles were erected inside the Crane paddock from which was fitted a specially tailored section of trawler netting to reach down to the top of the chain-link sides of the enclosure like a tent. Our initial reason for roofing this area was that we received a full-winged female Red-crowned Crane *Grus japonensis* from Baraboo, Wisconsin, in exchange for one of the two brothers originating from Rotterdam. We preferred not to pinion this adult bird and hope that this enclosure may be a model for future areas for cranes and storks.

The new Red-crowned Crane female has settled in well with the



*Roger Wilkinson*

Female Red-crowned Crane *Minerva* which was received at Chester from the International Crane Foundation in 1990.



*Roger Wilkinson*

Waldrapp Ibis at Chester Zoo.  
In 1990 seven chicks were reared.

Rotterdam male and they are presently displaying. The White-naped Cranes *Grus vipio* laid for the first time last year and one of the second clutch eggs proved fertile but died during development.

Two Sarus Cranes *Grus antigone* were hatched. One was reared by a bantam but the chick left with its parents failed despite their experience in successfully rearing a chick in 1989. Most significant of all was the hatching of two chicks from eggs laid by one of our pairs of West African Crowned Cranes *Balearica pavonina pavonina*. This species is particularly difficult to propagate in that when they can be persuaded to breed they tend to lay in the late summer; that is in the same months as they would be laying in West Africa towards the end of their rainy season. The two chicks hatched under a bantam on 25th September but had to be separated because of the aggression of one towards the other. The chick left with the bantam was found dead shortly afterwards. The remaining chick was then reunited with the foster. That chick really was a survivor and despite the trauma of a green stick fracture is now well grown and still with its foster mother. The Demoiselle Cranes *Anthropoides virgo* laid but again the eggs were infertile. Two White Storks *Ciconia ciconia* were reared by their parents and these together with one of the chicks that we bred in 1989 have since been sent to Bristol Zoo.

A male Andean Condor *Vultur gryphus* was incubator hatched and puppet-reared, and is destined for Antwerp Zoo. Since 1985 we have reared a total of eight chicks. The previous year's young female Condor has now joined Moscow Zoo. We also had a good year with owls; our most important success being that both pairs of Spectacled Owl *Pulsatrix perspicillata* reared a youngster. Three Great Horned Owls *Bubo virginianus* and a Snowy Owl *Nyctea scandiaca* were hand-reared and three further Snowy Owls, two European Eagle Owls *Bubo bubo* and seventeen Barn Owls *Tyto alba* were parent-reared. As previously the Barn Owl chicks were taken by Carol Hackney for the Keele University monitored release programme. Carol tells me that zoo-bred Barn Owls released in Cheshire and Staffordshire in 1989 are still being reported from their release areas and that there is a strong probability that one pair of zoo-bred owls, released in Staffordshire in 1988, successfully reared chicks in 1990. The two female White-faced Scops Owls *Otus leucotis* received from London Zoo in 1989 have now been joined by an unrelated Belgian-bred male. During the year a male Milky Eagle Owl *Bubo lacteus* was received on loan from Rotterdam Zoo. A generous gift from an anonymous benefactor allowed us to build two new very spacious aviaries for our Snowy Owls. These have been landscaped to represent a tundra habitat the owls have quickly taken to these and seem well settled in their new homes.

Waterfowl are well represented at Chester and 1990 additions include Smew *Mergus albellus*, Garganey *Anas querquedula*, Eider *Somateria mollissima* and Lesser White-fronted Geese *Anser erythropus*. Breeding this year included amongst the endangered species eight White-winged Wood Ducks *Cairina scutulata*, ten Hawaiian Geese *Branta sandvicensis* and four Ruddy-headed Geese *Chloephaga rubidiceps*. We have two pairs of White-winged Wood Ducks on loan from the Wildfowl and Wetlands Trust and the youngsters have been consigned to them for distribution to other collections. We receive many birds from Jersey Wildlife Preservation Trust and it was therefore a pleasure to be able to send them a second pair of Ruddy-headed Geese together with half a dozen Mandarin Ducks *Aix galericulata*. Other waterfowl bred this year included White-faced Whistling Ducks *Dendrocygna viduata*, Fulvous Tree Ducks *Dendrocygna bicolor*, Common Shelduck *Tadorna tadorna*, Marbled Teal *Anas angustirostris*, Tufted Duck *Aythya fuligula*, Red-crested Pochard *Netta rufina*, Carolina Wood Duck *Aix sponsa* and Maned Geese *Chenonetta jubata*.

We had a poor year with our Humboldts Penguins *Spheniscus humboldti* with only three chicks hatched. Hopefully this reflected changes in the demography of our group with older previously successful birds being lost from the group whilst we still await younger birds to mature to replace them. However, other Zoos have recently had major problems with their penguins and we are keeping a watchful eye over the situation.

Finally to end where I often start; that is right at the beginning of the taxonomic sequence with ratites and their relatives. Our Chilean Tinamous *Nothoprocta perdicaria* continued to breed and their nearest relatives, the Rheas *Rhea americana* reared three chicks. We received two male Red-necked Ostriches *Struthio camelus massaicus* from Fota Wildlife Park, the second to replace one that failed to establish itself at Chester. We expect to receive soon a female Red-necked Ostrich from Cotswold Wildlife Park. The Emus *Dromaius novaehollandiae* gave an excellent Easter exhibition with their five newly-hatched chicks but despite previous requests for chicks these again proved difficult to place. As such we shall not permit the Emus to hatch any chicks this year. I only wish we have similar problems in requiring some of the more difficult species not to breed!

## NEWS AND VIEWS

The following note appeared under the heading "Rare Success" in the Daily Mail, 31st July 1991. "Window cleaner Philip Fisher, 37, of Honingham, Norfolk has bred a rare South African White-bellied Sunbird for the first time in this country, feeding it with spiders which he collected on his round."

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The Third International Parrot Convention will be held in Puerto De La Cruz from Thursday, 15th September to Sunday, 28th September 1994 and will be sponsored and organized once again by Loro Parque. In Loro Parque's 24th Newsletter, dated August 1991, Tony Silva lists some of this year's successful breedings of rare species of parrot. These include Pretre's Yellow-shouldered and Yellow-faced Amazon Parrots, the Fiery-shouldered Conure, the Red-quilled Lory, Purple-bellied and Great-billed Parrots and Illiger's and Caninde Macaws.

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The pair of Guilding's Amazon Parrot at Paradise Park, Hayle, has produced a chick which has been hand-reared successfully. Other species which have bred at the Park this year include Buffon's Macaw, Leadbeater's, Goffin's, Umbrella and Roseate Cockatoos, Crowned and Mauritius Pink Pigeons, the Yellow-fronted Woodpecker, the Red-breasted Goose and Crowned and Wattled Cranes.

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The "West Australian" published this short article entitled "Rare parrot eggs hatched" on 18th July 1991. "WELLINGTON: Two Australian cockatoos are among 26 rare parrot chicks hatched in a Singapore bird park where smuggled eggs were sent after being discovered in New Zealand last month. The New Zealand Conservation Department flew 38 eggs and eight chicks to the Jurong Bird Park on 28th June after quarantine regulations threatened their destruction. Customs officials found 52 eggs on two women arriving in Auckland from Los Angeles. Spokesman Jim Kidson said that of the eggs and chicks flown to Singapore 26 hatched, three eggs were still viable, nine died before hatching and three chicks died. He said the bird park had reported that of the 26 hatchings there were seven macaws, eight conures and four Amazon parrots, all from South America, three African Grey Parrots from Central Africa, two Australian

Cockatoos and two Eclectus Parrots whose habitat ranges from Indonesia to the Solomon Islands."

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The World Pheasant Association will make an International Census of Gallinaceous Species held in captivity on 31st December 1991. The primary objective is to assist in the future maintenance of viable captive stocks of endangered species. Members who keep gallinaceous birds in their collection are urged to help. Census forms may be obtained from Diane Hewitt, WPA census Co-ordinator, Windy Hall, Crook Road, Windermere, Cumbria, England.

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Our Council Member Alan Griffiths, who is a veterinary surgeon, writes about a virulent type of avian malaria, affecting particularly Australian parrakeets, which is becoming increasingly common.

"I am very interested in the problem created by Protozoan blood parasites because during the past six or seven years many people, including myself, in this area of Wales (Dyfed) have been losing young parrakeets eight to twelve weeks after their leaving the nest. At first the birds are strong flyers but after a while they mostly run, or hop, along the floor. If alarmed when perching they will drop to the ground because of the loss of the power of flight. These symptoms continue, getting progressively worse for perhaps a week until the birds die. Other birds simply die suddenly and not all of the birds from the same nest may be affected. Many of the birds appeared to be in reasonable condition but the post mortem examinations revealed haemorrhages in the heart muscle and gizzard and the pericardium was found to be full of blood. Histological examination of the heart muscle, gizzard and breast muscles showed a severe infestation with the schizonts (a stage in the life cycle) of a Leucocytozoon."

"Leucocytozoa are members of a group of blood inhabiting protozoa (i.e. the lowest form of animal life). Protozoa are found in soil, surface water, vegetation and the intestinal tracts of man and animals. However, Leucocytozoa are known to occur only in birds, so far as I know, with the exception of the Teiid Lizards in Brazil. Birds of many species have been found to be infected but the parasite is particularly host specific, i.e. one that kills ducks, for example, will not kill turkeys but may kill geese.

"As the mortality from this disease can be very high (a mortality of 35% has been reported in ducks and 70% in goslings at the Seney Wildlife

Refuge in the USA) it is important that we should reduce it. As usual, prevention is better than cure. It is known that the transmission of the disease from carrier to recipient is by the bite of a fly known as the Blackfly which belongs to the *Simulidae* family. These flies lay their eggs on stones or plants, just below the surface of water in fast flowing streams which are well oxygenated. So do not blame your garden pond for being a potential breeding site for the flies if you have been having trouble. The larvae hatch from the eggs in four to twelve days and can fly quite long distances. Incidentally, the larvae of the flies cannot be killed in the water by chemicals without killing most other animal life in the water. The disease cannot be transmitted by the injection of blood from an infected to a healthy bird, as the life cycle is dependant on its passage through the carrier insect viz., the Blackfly.

"Some aviculturists in this area who have had problems in the past, in the 1990 breeding season covered their aviaries with fine nylon (Mosquito) netting until mid-day, and then replaced it again in the evening as the flies are more active in the early morning and evening. "Blue" electric fly traps were also placed in front of the aviaries, and the entrance holes to the nest boxes were painted with a Vapona fly pen (which is apparently non-toxic to birds) and Vapona strips were hung in place under the nest box, inaccessible to the birds. These measures seem to have been reasonably successful in reducing mortality.

"Mr. Vic Simpson considers that the disease in this country is limited to Antipodean species of parrot only, and I have certainly not seen it in any Asiatic or South American species in the same range of aviaries. I have, however, come across a reference to this disease as being the cause of the decline of the Tahiti Blue Lory in the wild. I should be interested to know whether other people have had similar problems and what measures they have adopted to control the disease.

"I should like to express my appreciation and thanks to Mr. David Harwood, and Mr. David Thomas of the Carmarthen V.I. Centre for carrying out the Post Mortems, and to Mr. Vic Simpson of the Truro V.I. Centre for his interest."

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Dulcie Cooke has repeated her successful breeding of the Red-flanked Lorikeet and writes "It may be of interest to owners of Red-flanked Lorikeets *Charmosyna placentis*, that as mentioned in my article in the *Avicultural Magazine* 1991,97,1:3-8, the parent hen laid a further two eggs. These hatched in due course and were admirably and devotedly reared by the parents. They have proved to be two handsome little cocks.

At the time of writing (early August 1991) one is totally tame and steps on to my finger whenever it is proffered. The other younger one is extremely lively, not particularly tame and flies all over the aviary. They hatched on the 7th and 8th June 1991. On 7th July the older of the two by one day was showing red cheek patches which the younger bird took rather longer to develop. Both now have enormous purple ear patches sparsely streaked with gold. The purple-blue rump is clearly defined. The young birds left the nest within hours of each other when they were 6 ½ weeks old. The older and larger of the two fed himself from the nectar cup within four days and the smaller and younger one took about six days to learn to feed himself. From the first day out of the nest they returned to the nest box at night. As far as I could ascertain the parents fed the young cocks at night for a least one week after they had left the nest. During rearing they were quite the noisiest chicks I have ever encountered! At present the parents are extremely proud of their efforts and totally tolerant of their fine young sons."

She also writes "The homing instinct of birds is always a cause for wonder and interest, especially when it is exhibited in a species not usually associated with this ability and even more unusual perhaps when it occurs in a very young bird. Such was the case in the summer of 1991. A remarkable case of "homing" by a very young Ornate Lorikeet *Trichoglossus ornatus* was reported to the writer. Two very young birds, believed to be a cock and a hen were established in a small aviary forming part of a number of similar enclosures. One morning the cock escaped and flew up and down in the vicinity of the garden where the aviaries were situated. After a short time something must have frightened him and he flew off into the distance. The owner searched the area and spoke to as many residents as possible but no-one had seen the bird. By nightfall there was still no sign of it, nor was it seen or heard the following morning. The owner had to leave for work and it was not until the afternoon that his small son reported to his mother that "there is a parrot on the outside of one of the aviaries". The wife very wisely approached cautiously with a catching net hidden as much as possible. She found a very exhausted young cock clinging to the wires of "his" aviary with the hen trying to comfort him from the inside. He was so tired that it was possible to place the net over him and return him to the aviary without difficulty. He had been outside his aviary for just 30 hours."

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*From Malcolm Ellis*

Richard Meyer (formerly Richard Mark Martin and a member of our

Society) recently received his doctorate at Glasgow University for his thesis on The Feeding Ecology of the Red-billed Chough *Pyrrhocorax pyrrhocorax* L. in West Wales, and the Feasibility of Re-establishment in Cornwall, *Avicultural Magazine* 1991,97,2: 51-58. Dr. Meyer's research shows that the three former haunts of the Chough which he studied in Cornwall appear to be richer in its invertebrate prey, beetles and their larvae, ants and fly larvae, etc., than comparable sites in West Wales where the Chough continues to thrive. Richard considers three areas of Cornwall are suitable for re-establishment. These are north Cornwall, west Penwith and the Lizard. He favours the last.

According to a report in *Bird Watching Magazine*, 66: 87, London is set to have a new Waterfowl and Wetland Trust wildlife sanctuary. The Trust and Thames Water have planning permission for a 110 acre wildfowl reserve at Barn Elms reservoirs, about four miles from central London. However, the Trust has announced the imminent closure of the Peakirk Wildlife Gardens. Following strong protests, the Trust began discussions with Peterborough City Council, which would like Peakirk to survive but will not take direct responsibility for the centre.

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#### *From Dave Coles*

Formed just over eighteen months ago, the World Parrot Trust is already contributing significantly towards parrot conservation. Through its membership and fund-raising activities, the Trust has raised over £80,000 and is thus able to support a range of conservation projects, the largest of which is the purchase of a "conservation bus" for St. Lucia. This project is outlined in *Psitta Scene* the Trust's excellent quarterly magazine, along with items covering the reintroduction of Military Macaws in Guatemala and the recovery of the Orange-bellied Parrakeet. Details of the Trust and its work can be had from WPT, Glanmor House, Hayle, Cornwall TR27 4HY, U.K

The third annual meeting of the Blue Duck Captive Breeding Group took place at the National Breeding Centre, Mt. Bruce, New Zealand on 4th May 1991. The purpose was to discuss the 1990/91 breeding season which had seen an increase in the captive population to 25.17. A total of 6.3 had been reared in three collections. One adult death was recorded and the introduction of two wild caught females will inject much needed new blood into the population within New Zealand. If the 1991/92 season is equally successful, initial releases will take place, probably within Mt.

Egmont National Park. Presumably, these figures omit the breeding population held by the Wildfowl Trust.

A summary of the North Island Brown Kiwi studbook appears in issue number eleven of the Kiwi House Review, the excellent magazine of Otorohanga Zoological Society. The population at 31st December 1989 stood at 121 (55.38.28), a net gain of five over the previous year. Although not a significant increase overall, it is important as the eleven birds which died were mainly adults and the sixteen chicks which survived represents one of the highest annually reared, both in individuals and institutions. The preamble to the studbook gives an insight into some recently discovered facts about Kiwi nesting habits in the wild.

The first European studbook for the Red-crowned Crane *Grus japonensis* has just been completed. Compiled by Rob Belterman of Rotterdam Zoo, the population status as at 31st December 1990 stands at 115.

Attempts are to be made to reintroduce the White-tailed Sea Eagle back to Ireland after an absence of 90 years. The breeding nucleus, originating from Switzerland, Holland and Germany, is to be housed in breeding aviaries at the Fota Island Wildlife Park in County Cork. Young birds will be released, under the auspices of the Irish Wildbird Conservancy, at various sites in the counties of Clare and Kerry. The cost of the breeding venture is being covered by Eagle Star Insurance. A similar introduction, rearing imported chicks for releasing has met with some success in Scotland - eighty two were released over a period of years on the island of Rhum and, although mortality is reported at around 50%, pairs are now breeding with increasing success. Individuals perished by gun and poison and it is probably the educating of the people most likely to come into direct conflict with the eagles that will be the deciding factor governing the ultimate success of the Irish venture. The coastline of County Kerry is certainly a spectacular part of the British Isles and may again be home to these enigmatic birds.

Attitudes change, but ever so slowly, even in the scientific fraternity, as can be judged by the fate of the only known specimen of Bulu Burti Boubou Shrike *Lanaris liberatus*. Discovered in 1988 by Eddie Smith in the grounds of a hospital in the Bulu Burti district of central Somalia, it survived becoming a museum specimen by virtue of being the only one of its kind so far discovered. "Had it been more numerous" says Nigel Collar of I.C.B.P. "in the interests of conservation, we would have said collect one". Equally, though, a species is said not to exist until scientifically

described. Thankfully, I.C.B.P. suggested catching the bird and taking blood for DNA analysis. The bird was mist-netted and kept over a period of six months in an aviary during which time it was photographed, videotaped, tape-recorded and its behaviour studied. It was then released back to the wild. DNA analysis confirmed it to be a new species. If this is the first species to survive its baptism, as is stated in the August 1991 issue of *BBC Wildlife*, just how many skins, one wonders, are there in the world's museums of species discovered in the past decade or so!

The American Federation of Aviculture's journal, *Watchbird* continues to be one of the most interesting avicultural publications available. Amongst subjects covered in the Dec/Jan. 1991 and Feb./Mar 1991 issues are the breeding of the Java Mannikin, Chestnut-capped Ground Thrush, Toco Toucan, Edward's Fig Parrot, Red-crested Cardinal, Hispaniolan Conure, Tucuman Amazon and Goliath Herons. All are illustrated using colour photographs.

The plans for the long term survival of the Takahe are beginning to come to fruition. After years of careful management, research and captive breeding the population of this, the world's largest rail, now stands at around 200. It has been a policy of the New Zealand Wildlife Service to introduce species to predator-free islands in the hope of increasing numbers. The Takahe is no exception and is now present in small numbers on four: Mana and Kapiti off the west Coast of the North Island just north of Wellington, Maud in the Marlborough Sounds and Tiritiri Matangi, in the Hauraki Gulf. Mana has been accorded the highest priority for the long term survival of the species. It has also been successfully introduced to a valley in Fiordland.

\* \* \*

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# AVICULTURAL MAGAZINE



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No. 4  
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## CONTENTS

Breeding the Ashy Starling at Chester Zoo By Roger Wilkinson and Wayne McLeod .....	164
Breeding Josephine's Lorikeet at Palmitos Park By Rosemary Low .....	167
Padstow Tropical Bird Gardens By Malcolm Ellis .....	174
Breeding Channel-billed Toucans at Chester Zoo By Roger Wilkinson and Wayne McLeod .....	179
Pretre's Amazon Parrot By Rosemary Low .....	185
Visit to Parklands By Stewart Pyper .....	190
News and Views .....	191
Book Review .....	201
Video Review .....	202
Index to Volume 96 - 1990 and List of Contributors .....	206
Index to Volume 97 - 1991 and List of Contributors .....	212

# AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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*R. Wilkinson*

Ashy Starling *Cosmopsarus unicolor*. Immature bird with the tail now grown but the bill still pale and iris dark.

# AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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## BREEDING THE ASHY STARLING AT CHESTER ZOO

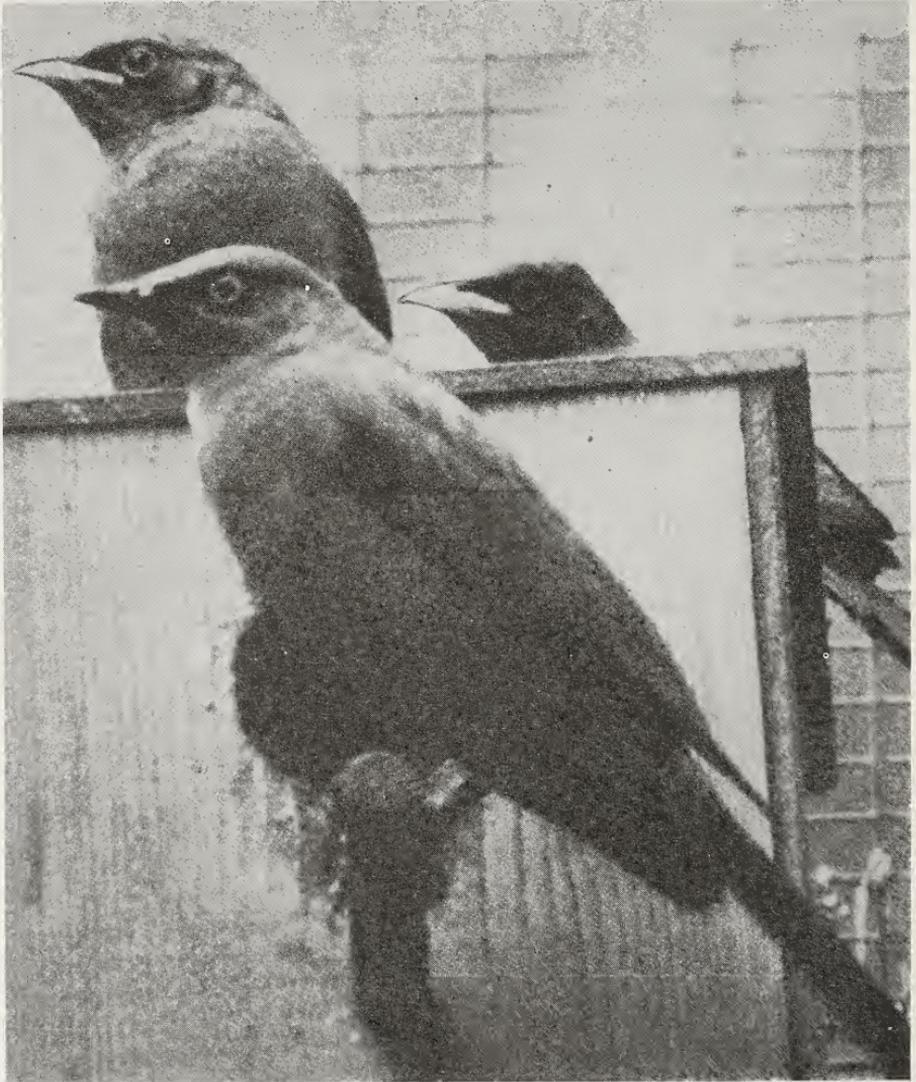
By Roger Wilkinson (Curator of Birds)  
and Wayne McLeod (Senior Keeper)

Ashy Starlings *Cosmopsarus unicolor* have a limited distribution in East Africa which is virtually restricted to Tanzania but also just extending to southern Kenya (Hall 1970, Howard & Moore 1980). Further north and east into Kenya the Ashy Starling is replaced by its better known relative the Royal or Golden-breasted Starling *Cosmopsarus regius*. The Ashy Starling, unlike its more colourful relative, has been imported infrequently and less is known of its behaviour in the wild or in captivity. Ashy Starlings resemble Royal Starlings in their general build and proportions but are of a brownish grey colour slightly glossed green only on the wings and tail.

Chester Zoo received a pair of Ashy Starlings in August 1988 from Paulton's Park where the birds were causing problems because of their aggression in a mixed species exhibit. At Chester the Ashy Starlings were established as sole occupants in one of the planted aviaries in the upstairs gallery of the Tropical House. They were fed on our "softbill mixture" of minced beef, rubbed with biscuit flour, grated hard-boiled egg, grated carrot and commercial insectile food supplemented with a vitamin/mineral additive. Additionally finely diced apple, chopped tomatoes and grapes were given. A nest box measuring 15 cm x 20 cm x 30 cm high (6 in x 8 in x 12 in) with an entrance hole of 5 cm (2 in) diameter was provided for this pair. Unlike many other starlings, no attempt was made to pack the box with nest material. Instead the floor of the nest box was covered with a layer of nest material in which a shallow cup was fashioned in one corner of the box. When checked on 22nd March 1989 the nest contained three eggs.

On the 29th March the parents were first seen to carry food into the nest which when inspected on 1st April contained two chicks. The first of these fledged on 24th April and the second two days later. Throughout the nestling period both parents fed the chicks on the live food provided which included mealworms, wax moth larvae, and early instar locusts.

On fledging the juveniles differed from the adults in having pale horn coloured bills and prominent pale periophthalmic rings surrounding dark irides. In the adult the bill is dark and the iris pale without a surrounding eye-ring. Recent fledglings have a considerably shorter tail than the adults but this soon grows to adult proportions.



*R. Wilkinson*

Ashy Starlings *Cosmopsarus unicolor*. Adult with two recent fledglings. Note the short tail, pale bill, pale periophthalmic ring and dark iris of the fledglings.

A second nesting attempt was begun by the Ashy Starlings in late September. By 29th September it was judged that the parents had commenced incubation and when the box was inspected on 2nd October a clutch of three eggs was found. The parents were first seen carrying food to the nest on 13th October indicating an incubation period of around 14 days. The behaviour of the adults was as for the first brood until 19th October when the male appeared lethargic and was removed for individual hospitalization. The female continued to rear the chicks on her own and on 4th November both chicks fledged. The nestling period of about 31 days for this second brood compared with 26 - 28 days for the first nesting may reflect the fact that the workload of feeding the youngsters was for the first brood shared by both parents.

Brown & Britton (1980) list two records of nesting by Ashy Starlings in East Africa; one in February, the other in March but gave no details of these. Walters (1980) indicates that the nest and eggs of Ashy Starlings are undescribed. For that reason a detailed description of the eggs is given below.

The eggs were sub-elliptical, smooth and slightly glossy and at first glance appeared to be of a uniform pale blue colour. The eggs of the related Royal Starling are described as pale greenish blue minutely speckled with reddish brown (Mackworth-Praed & Grant, 1960). Closer inspection of one of the Ashy Starling eggs revealed some slight staining and several obscure pale small reddish brown blotches on the narrow end. Less obviously the pale greenish blue colour also appeared to be marked with uniform minute faint brownish speckles which were so tiny that they could easily have been overlooked.

We are unaware of any other reports of the captive breeding of Ashy Starlings and would welcome further observations on this or related species in the wild or in captivity.

#### REFERENCES

- BROWN, L.H. & BRITTON, P.L. (1980). *The Breeding Seasons of East African Birds*. East African Natural History Society, Nairobi.
- HALL, B.P. & MOREAU, R.E. (1970). *An Atlas of Speciation in African Passerine Birds*. British Museum (Natural History) London.
- HOWARD, R. & MOORE, A. (1980). *A Complete Checklist of the Birds of the World*. Oxford University Press, Oxford.
- MACKWORTH - PRAED, C.W. & GRANT, C.H.B. (1960). *African Handbook of Birds, Series One, Birds of Eastern and North Eastern Africa. Vol. II 2nd Edition*. Longman, London
- WALTERS, M. (1980). *The Complete Birds of the World*. David & Charles, Newton Abbot.

## BREEDING JOSEPHINE'S LORIKEET AT PALMITOS PARK

By Rosemary Low  
(Curator, Breeding Centre)

The rich avifauna of New Guinea includes numerous brightly coloured small parrots. In contrast, those from the tropics of South America, beautiful as they are, appear almost dull. One of the most beautiful is surely Josephine's Lorikeet *Charmosyna josefinae*. Briefly, it can be described as a smaller, shorter-tailed version of Stella's Lorikeet, which is represented in aviculture by *C. papou goliathina*. Josephine's differs from Stella's in having the upper side of the tail red; in Stella's it is green. Josephine's has several notable assets from the avicultural viewpoint, especially its beauty, tameness and appealing personality. Adults are sexually dimorphic, have a fascinating courtship display, nest fairly readily and mature early.

Josephine's is a small lory, with a body length of about 12 cm and a total length, when adult, of about 24 cm. It has a graceful shape as well as a beautiful colour scheme. Three sub-species are recognised. I believe that *sepikiana* is the best known in aviculture. In this race the area of blackish-green on the abdomen is larger and the front of the black patch on the crown is streaked with grey or bluish-grey. The streaking is said to be bluer in the nominate race and absent or nearly so in *cyclopum*. The nominate race is said to have the lower back red in the male and green in the female (Forshaw, 1973). In the other two sub-species the female has the lower back and sides of the flanks brilliant daffodil yellow.

In late 1988, while curator at Loro Parque, Tenerife, I obtained three male Josephine's which had been bred there from one pair during the previous thirteen months. I had no idea where I would be able to obtain females as they are hard to acquire. This was the first new species I had added to my own collection for three years. There was little need for at that time I was working with over 200 species of parrots! Early the following year I moved to Gran Canaria to look after the birds in the Breeding Centre of Palmitos Park. A few months later the park's founder and owner, Mr. K. Paulmann, imported three female and one male Josephine's from Germany. Unfortunately, two of the females were not in good health and one of these died. The third, however, paired with one

of the captive-bred males, has formed a successful breeding pair.

The lorries are housed in an enclosed building to protect them from the strong sun and winds of the mountain location. A section of the roof above each row of cages is covered with green shade cloth, thus giving the whole building an airy, sunny, outdoor feel. Each pair of lorries is housed in a suspended cage measuring 2 m long, 76 cm wide and 1 m high (6 ft. 6 in x 2 ft. 6 in x 3 ft. 3 in).



*Rosemary Low*

Two young male Josephine's Lories.

### *Display and copulation*

The behaviour of this species is very interesting to observe. When excited they flick the head very quickly, sometimes also waving the long tongue outside the beak. Without moving the feet, they jerk the body from side to side, keeping the head low, almost in line with the body. The display is as obvious in the female as in the male. Mating is preceded by head bobbing in both sexes and, as in all lories, is performed by the male with both feet on the female's back.

### *Incubation*

In February of the following year, 1990, the pair consisting of 1988 hatched male and the wild-caught female, nested. The female laid on 4th and 6th or 7th February. In this species, and other members of the genus, incubation is carried out by male and female. Anton Spenkelink found that of his pairs the male incubates for the first five to seven days, then male and female share incubation, then after two weeks the female incubates. I shall keep notes in future to see if a similar pattern emerges in our pairs, although often both birds are in the nest together.

Eggs are usually laid at intervals of three days, sometimes two days. The clutch always consists of two eggs. New laid eggs are, of course, white like all parrot eggs, but after a few days the shell acquires a few grey lines, something I have noticed only in the closely related Stella's *C. papou goliathina* and Fairy *C. pulchella pulchella* species. In *Charmosyna* lorikeets incubation does not commence with the first egg and usually not with the second egg - a strange facet of behaviour. However, this pair of Josephine's starts to incubate before the second egg is laid because the young hatch on consecutive days, whether the eggs are laid two days or three days apart. This probably means that incubation commences the day before the second egg is laid. So far one other pair (both captive-hatched) has bred, producing two young, which also hatched on consecutive days. In the instances where two chicks hatched (both pairs), they hatched on the following number of days after the eggs were laid: 27 and 25 or 26, 26 and 25, 27 and 25, 28 and 26 and (captive-bred pair), 29 and 27. Thus the true incubation period (calculated on the second egg) has varied from 25 to 27 days. Four of these eggs were measured, two from each of two females. Those of the original wild-caught bird measured 19.5 x 22.5 mm and 18.8 x 22.5 mm, and those of the other wild-caught female 19.8 x 25 mm and 19.5 x 25.5 mm. In these two eggs, which were the female's first, the embryos died at an early stage.

To revert to the result of the first clutch, the eggs hatched on 3rd March (pipping commenced on 1st March) and 4th March. The chicks were removed for hand-rearing on 20th March. As with all subsequent chicks, they were closed-ringed with 5.5 mm rings when they were about 21 days old.

### *Rearing*

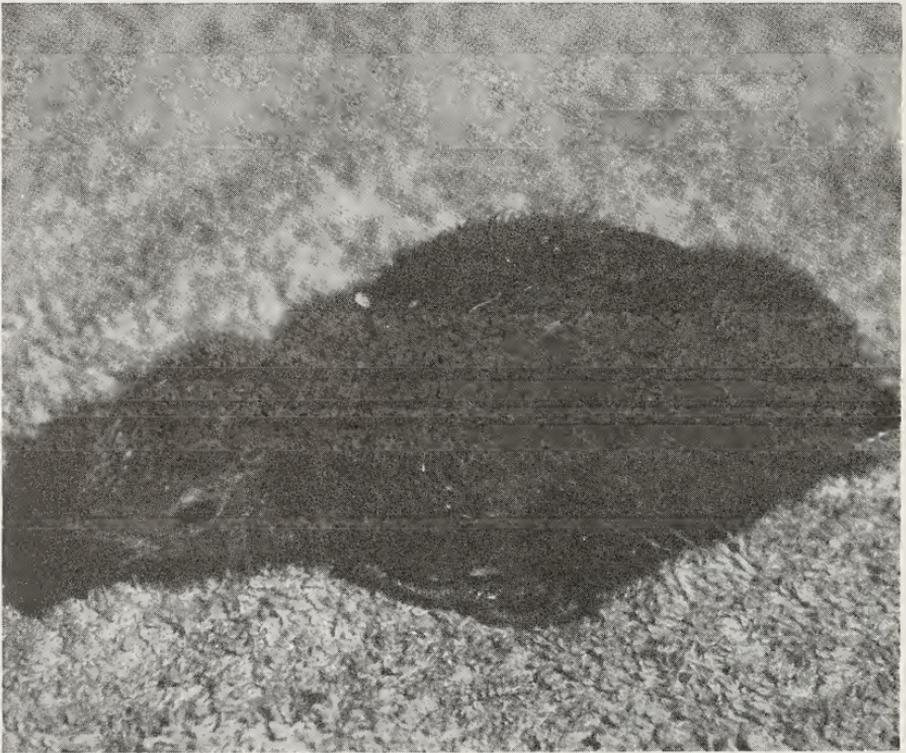
All of the young have been well fed by their parents. The first two were removed because the youngest chick had a swollen leg from the age of about nine days. After a few days in the hand-rearing room the swelling had gone and the leg was normal. In the second nest, the second chick died at 10 days; the reason was unknown. The other chick was immediately removed for hand-rearing. In these two cases, the female laid again 31 and 19 days after the young were removed. The eggs of the second nest had been laid on 20th and 22nd April and hatched on 16th and 17th May. In the third nest eggs were laid on 15th and 18th June and hatched on 12th and 13th July. Both young were reared by the parents. The first left the nest on 28th August when it was 47 days old and the second did not until 13th September when it was 62 days. The pair did not nest again that year and their young were removed on 1st October. Their first three clutches had produced six eggs and six chicks, five of which were reared. Surprisingly four of them proved to be females!

In 1991, the female laid on 28th and 31st March. The second egg hatched on 27th April; the first egg was infertile. The chick was removed for hand-rearing at 11 days. It felt cold, the weather was not as warm as usual and the parents spent much of the time out of the nest. Two chicks keep each other warm - but one is more vulnerable to chilling. The chick was removed on 8th May but the female did not lay again until 20th and 23rd June. These eggs hatched on 18th and 19th July. The young were reared without incident and left the nest on 18th September (after 62 and 61 days).

Meanwhile, the very first youngster, hatched on 3rd March 1990 and paired to a 1988 Loro Parque hatched male, was nesting. On 25th February before she was 52 weeks old, she laid her first egg, and the second on 28th February. The nest was very wet and the embryos died about two thirds of the way through the incubation period. She laid the first egg of the second clutch on 22nd May and the second egg probably on 25th May. They hatched on 20th and 21st June. The chicks were very well cared for by the parents and left the nest on 19th August (60 and 59 days).

*Immature plumage*

It is interesting that although the young of the closely related Fairy and Red-flanked *Charmosyna placensis* Lorikeets can be sexed in nest feather those of Josephine's can not. The yellow feathers on the lower back and rump of the females do not appear for about four months and it is at least another two or three months before full adult plumage is acquired. Only one of the young (which is just independent at the time of writing) had yellow feathers on the back in nest feather. However, Anton Spenkelink, a most experienced breeder of this species, told me that this is no indication of sex as males can have yellow feathers and lose them in adult plumage. Immature plumage otherwise differs from that of the adults only in the less well defined shaft streaking on the nape and thighs. However, the beak is brown/orange (coral in adults), the cere is whitish (instead of coral), the iris is brown (orange in adults), the skin surrounding the eye is paler grey and the feet are greyish-pink (pale coral in adults).



*Rosemary Low*

Josephine's Lorikeet aged 35 days, hatched at Palmitos Park.

### *Diet*

Food for this species at Palmitos Park consists mainly of nectar (either Nekton-Lori, or a mixture of Milupa baby cereals and honey, with vitamins and minerals added occasionally) and fruit; each pair receives at least half an apple or half a pear daily, with other fruits in season, especially cactus fruit, of which nearly all lorries are very fond. The Josephine's relish tinned sweet corn kernels, and the young breeding pair like our home-made rearing food which contains carrot, hard-boiled egg, non-fat cheese and whole grain bread. Soaked dried figs and raw carrot are also eaten. I have never tried the dry lory diets; if they would eat it, it could be given as a small part of the diet; nectar should always be available, given fresh twicedaily.

The hand-rearing food is varied; it contains Milupa baby cereal, wheat germ cereal and Nekton-lori; to most food is added papaya and a little of the rearing food described above. Liquid calcium or the calcium and mineral supplement Nekton MSA is added once daily.

### *Age at independence*

Hand-reared young will start to feed themselves at an early age if given the opportunity. I gave a small container of warm rearing food to the first two when they were only five weeks old and they fed themselves immediately - in fact, they took an excessive amount. They each weighed 53 gms and I was giving them only 4 gms or 5 gms at a time, yet on the first day they filled their crops with 13 gms of food! If there are two young I do not encourage this early weaning because they spill food on each other's heads and object greatly to their feathers being cleaned.

Parent-reared young leave the nest then they are about seven weeks old and start to feed themselves on nectar almost immediately. However, I prefer to leave young lorries with their parents for four or five weeks, so that they can learn as much natural behaviour as possible. Hand-reared young are as suitable as those which have been reared by their parents for breeding provided that they are reared with a sibling or introduced to their own species as soon as they are independent.

### *Future in aviculture*

Josephine's Lorikeet was unknown in aviculture until the late 1970s. Not many have been imported and it is not well established. Perhaps only in Germany and the Netherlands are there a few breeding pairs. I do not know of any in the UK because of the shortage of females. Its future in aviculture does not seem assured

and a European studbook would, if initiated, at least provide some ideas of the numbers held. The problem would be that nearly all are in private hands, not in zoos, and many private aviculturists are not good at co-operating in this way.

#### *Status*

Very little is known about this lorikeet in the wild. It occurs in the mountains of western and central New Guinea. It has been described as scarce and local but that may be due to lack of observers or the species being difficult to see in foliage. Whatever its status, aviculturists must do their best to ensure that this exquisite lorikeet is maintained in our aviaries - preferably in planted aviaries where the birds will live a more natural and active life and their "owners" will derive even greater enjoyment from their company.

#### REFERENCE

FORSYTH, J.M. (1973). Parrots of the World, Lansdowne Press, Sydney, Australia.

\* \* \*

## PADSTOW TROPICAL BIRD GARDENS

By Malcolm Ellis  
(St. Breock, Wadebridge, Cornwall)

Situated on the north Cornwall coast in south-west England, Padstow could, and perhaps still can, be described as a quaint old Cornish fishing port. Fishing continues though long ago it was overtaken in importance by the holiday trade. The bird gardens are in a quiet largely residential part of the town. Relatively small - approx. two acres (just under one hectare) in extent - they are somewhat reminiscent of a smaller version of the late Len Hill's Birdland at Bourton on the Water, Glos. The gardens are on three levels. The main one has aviaries on four sides of a large lawn (complete with gazebo), plus on one side the Tropical House and on another a two-aviary conservatory-type structure. Steps lead up to the terrace with aviaries on three sides of a small lawn, with to one side a butterfly exhibition and the tea room (with good views out across the estuary). The lower garden includes the waterfowl/flamingo enclosure, wader/waterbird aviary and other aviaries.

There is a nice mix of birds in good sensible aviaries and enclosures, well manicured lawns, neatly tended flower beds, shrubs and trees, some of them exotic, which like many of the birds benefit from the milder climate in the south-west. The all too common temptation to keep adding more birds and aviaries has been resisted, and the pleasant relaxed atmosphere and feeling of a spacious walled-garden has been retained (Providing a haven from the hubbub of the town during the height of the holiday season). The aviaries are mostly around the perimeters and many have the advantage of backing onto or, in a few cases, having the back and one side formed by Cornish stone walls.

The entrance to the gardens is in Fentonluna Lane, the other side of which beyond another stone wall and high trees is the deer park in front of Prideaux Place, an Elizabethan mansion.

Jack Brown and his wife moved in the late nineteen-sixties to Cornwall and set about creating Padstow Tropical Bird Gardens from an "unkept piece of land which had not seen a spade for 20 years." The gardens opened to the public at Whitsun 1970. The 'walk-in' Tropical House was opened two years later. The house was described in the *Avicultural Magazine* 1973(a) by the first Curator Richard Mark Martin.

Early inhabitants of the gardens included Sulphur-breasted Toucans *Ramphastos sulfuratus*, White-crested Laughing Thrushes *Garrulax leucolophus*, Rosy and Chilean Flamingos *Phoenicopterus r. ruber* and

*P. chilensis*, two species of cranes and various waterfowl, including Baikal Teal *Anas famosa*, Red-crested Pochard *Netta rufina*, White-faced Whistling Ducks *Dendrocygna viduata*, Mandarins and Carolinas *Aix galericulata* and *A. sponsa*. There were also macaws and other parrots.

Among the first birds to breed were Great Kiskadees *Pitangus sulphuratus*, the parent birds having been bred at the now defunct Winged World at Heysham, Lancs., where Richard had worked previously. Another early member of the Padstow keeping staff was Dave Coles (until recently a Council Member of our Society), who, when Richard moved on, eventually became Curator, before himself moving on.

During the early years another species which bred at Padstow was the Emerald Dove *Chalcophaps indica*. Schalow's Touracos *Tauraco livingstonii schalowi* nested unsuccessfully, and White-cheeked Touracos *T. leucotis* bred first in 1971, but the two young died. They were badly affected with *Aspergillus fumigatus*, the fungal spores coming it was thought from straw used as nesting material (Martin, 1973, b). That practise was immediately discontinued and White-cheeked Touracos later bred successfully through to the second generation and beyond. Padstow Gardens have been very successful with this touraco, and birds from there have gone to several zoos, bird gardens and other collections.

They were also very successful with (Thailand) Hoopoes *Upupa epops longirostris*. During 1973 fifteen were hatched and reared, though young from some clutches suffered from splayed legs (Martin, 1974). The leg problem initially thought to be due to a vitamin deficiency, was traced to the nest-box floor being covered with peat, which gave little support to the chick's legs and feet and caused them to splay. Chips of rotten wood were used as a replacement and eradicated the problem (Coles, 1982).

The most notable breeding successes have been with the Tacazze Sunbird *Nectarinia tacazze* (Coles, 1978, Martin, 1976), the Hunting Cissa or Green Magpie *Cissa chinensis* (Coles, 1978), and the Crimson-rumped Toucanet *Aulacorhynchus haematopygus* (Evans & Coles, 1982, Hughes, 1988). All three were first breedings of these species in Britain and for each the Avicultural Society Certificate of Merit was awarded.

Bred at Frankfurt Zoo, two pairs of Fairy Blue Wrens *Malurus cyaneus* although only in immature plumage and while still in quarantine, started nest building using shredded newspaper. Dave Coles has kindly supplied me with details of how one pair were placed in the Tropical House, and within eight days completed a nest and went on to rear two young. The second pair also quickly built a nest and laid in an outside aviary. The male unfortunately died the day the first egg hatched. The port mortem revealed worms of a type that could not be identified. The British Museum (Natural

History) thought that they could possibly have been a new species. During the course of the next six months, sadly, the remaining three parents and three young were lost. One disappeared, two died from causes which could not be established and the others died from different causes.

Other breedings that have been reported in our magazine are the Scarlet Ibis *Eudocimus ruber* (Evans, 1982, Hughes and Owen, 1988), and the Golden Heart Dove *Gallicolumba rufigula* (Owen, 1985), the Plush-capped Jay *Cyanocorax chrysops*, also known as the Pileated and Uracca Jay (Coles, 1978), the Red-headed Laughing Thrush *G. erythrocephalus* (Coles, 1979), and most recently the Red-tailed Laughing Thrush *G. milnei* (Haines, 1989). The last initially was thought to be the first breeding here, but subsequently there was a prior claim by a non-member, who had as I recall, pipped Padstow's claim by a matter of just a week or so.

In the past other species which have bred include Bartlett's and Luzon Bleeding Heart Doves *G. criniger* and *G. luzonica* and the Sun Conure *Aratinga solstitialis*. Among other recent breedings are the Violaceous Touraco *Musophaga violacea*, the Red-crested species *T. erythrolophus*, Dusky Lory *Pseudeos fuscata*, Lesser Sulphur-crested Cockatoo *Cacatua sulphurea*, Noble Macaw *Ara nobilis*, Lilacine Amazon *Amazona autumnalis lilacina* and Orange-headed Ground Thrush *Zoothera citrina*. 1991 breedings to be added to the list include the Gough Island Moorhen *Gallinula nesiotis comeri*, Bronze-wing Pigeon *Phaps chalcoptera* and Superb Spree *Spreo superbus*.

Having initiated the idea of breeding the Chough *Pyrhocorax pyrrhocorax* in aviaries as a means of providing birds to attempt to re-establish this splendid corvid around the Cornish coast as described in the Avicultural Magazine 1991 97,2 : 51-58, it is a great disappointment that despite having an aviary with a custom-made rock-face for nesting, the Padstow birds have never progressed past egg-laying. It is perhaps because the aviary does not provide sufficient seclusion. Surgical sexing has shown them to be two true pairs. They are now getting on in years. Richard can recall collecting one, already an adult, from north Wales in 1971. So one is at least 20 years old, probably more.

As well as several species mentioned already, the present collection now in the hands of David Brown, also includes Ringed and Hottentot Teal *Callonetta leucophrys* and *A. punctata*, Roulroul Partridge *Rollulus roulroul*, African and American Jacana *Actophilornis africana* and *Jacana spinosa*, Black-winged Stilt *Himantopus himantopus*, Egyptian Plover *Pluvianus aegyptius*, Stella's Lory *Charmosyna papou goliathina*, Golden-winged Parrakeet *Brotogeris chrysopterus*, Red-backed Mouse-bird *Colius castanotus*, Laughing Kingfisher *Dacelo novaeguineae*,

Grey-headed Kingfisher *Halcyon leucocephala*, White-fronted Bee-eater *Merops bullockoides*, Lilac-breasted Roller *Coracias caudata*, Lesser Green Broadbill *Calyptomena viridis*, Hardwick's Fruitsucker or Orange-bellied Leafbird *Chloropsis hardwickeii*, Fairy Bluebird *Irena puella*, Beautiful Sunbird *Nectarinia pulchella*, Golden-breasted Starling *Cosmopsarus regius*, Burchell's Starling *Lamprotornis australis* and Green Jay *Cyanocorax yncas*. A Grey-necked Crowned Crane *Balearica pavonina* from Kenya and some of the flamingos have lived in the gardens since the collection started.

A small selection of live butterflies are exhibited during the summer months, and there is - Butterfly World - an excellent permanent display of butterflies, moths and other insects, mounted and imaginatively set-up with the assistance of Dr. Chris Samson, F.R.E.S.

I like to cycle to Padstow along the 'Camel Trail'! In the Cornish language *camel* means winding, and the trail or path is along the south bank of the River Camel. The footpath-cum-cycle-trail follows what was the route to Padstow of the railway line which was closed to passenger traffic in 1967. Opened in 1899 "The five and a half miles of track between Wadebridge and Padstow afforded the traveller one of the finest stretches of scenery in Cornwall, ....". The river and estuary are a good place for wild birds, especially waders and waterfowl. Large numbers pass through each spring and autumn and winter there. A few years ago I was fortunate enough to see three European Spoonbills *Platalea leucorodia*, which were present for a week or so during October. More recent visitors have included at least one Little Egret *Egretta garzetta* and, according to some reports, a Red Kite *Milvus milvus*.

#### REFERENCES

- COLES, D. (1978). Breeding the Tacazze Sunbird at Padstow Bird Gardens. *Avicultural Magazine*, 84: 69-73.
- COLES, D. (1978). Breeding the Plush-capped Jay at Padstow Bird Gardens. *Avicultural Magazine*, 84: 125-128.
- COLES, D. (1978). Breeding the Hunting Cissa at Padstow Bird Gardens. *Avicultural Magazine*, 84: 183-185.
- COLES, D. (1979). Breeding the Red-headed Laughing Thrush at Padstow Bird Gardens. *Avicultural Magazine*, 85: 16-17
- COLES, D. (1982). Captive Management of the Hoopoe. *Avicultural Magazine*, 88: 226-234.
- EVANS, K. and COLES, D. (1982). Breeding the Crimson-rumped Toucanet *Aulacorhynchus haematopygus* at Padstow Bird Gardens (Cornwall). *Avicultural Magazine*, 88: 193-198.
- EVANS, K. (1983). Hand-rearing a Scarlet Ibis *Eudocimus ruber* at Padstow Bird Gardens, Cornwall. *Avicultural Magazine*, 89: 215-217.

- EVANS, K. (1984). Hand-rearing the White-cheeked Touraco *Tauraco leucotis* at the Padstow Bird Gardens (Cornwall). *Avicultural Magazine*, 90: 32-34.
- HAINES, C.M. (1989). Breeding the Red-tailed Laughing Thrush *Garrulax milnei* at Padstow Tropical Bird Gardens (Cornwall). *Avicultural Magazine*, 95: 10-13.
- HEWSTON, N. (1984). Breeding the White-cheeked Touraco *Tauraco l.leucotis*. *Avicultural Magazine*, 90: 209-215.
- HUGHES, R. and OWEN, A. (1988). Hand-rearing the Scarlet Ibis *Eudocimus ruber*. *Avicultural Magazine*, 94: 96-100.
- HUGHES, R. (1988). Hand-rearing the Crimson-rumped Toucanet *Aulacorhynchus haematopygus* at Padstow Bird Gardens. *Avicultural Magazine*, 94: 182-189.
- MARTIN, R.M. (1973 a). Aspects of a new Tropical House at Padstow Bird Gardens. *Avicultural Magazine*, 79: 89-93.
- MARTIN, R.M. (1973 b). Observations on the unsuccessful rearing of two White-cheeked Touracos *Tauraco l. leucotis* at Padstow Tropical Bird Gardens. *International Zoo Yearbook*, 13: 122-123.
- MARTIN, R.M. (1974). Observations on breeding the Hoopoe *Upupa epops* in captivity. *International Zoo Yearbook*, 14: 99-102.
- MARTIN, R.M. (1976). Problems of breeding small nectar-feeding birds. *Avicultural Magazine*, 82: 165-168.
- OWEN, A. (1985). Breeding the Golden Heart Dove *Gallicolumba rufigula* at Padstow Bird Gardens, Cornwall. *Avicultural Magazine*, 91: 129-130.

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## BREEDING CHANNEL-BILLED TOUCANS AT CHESTER ZOO

By Roger Wilkinson (Curator of Birds)  
and Wayne McLeod (Senior keeper)

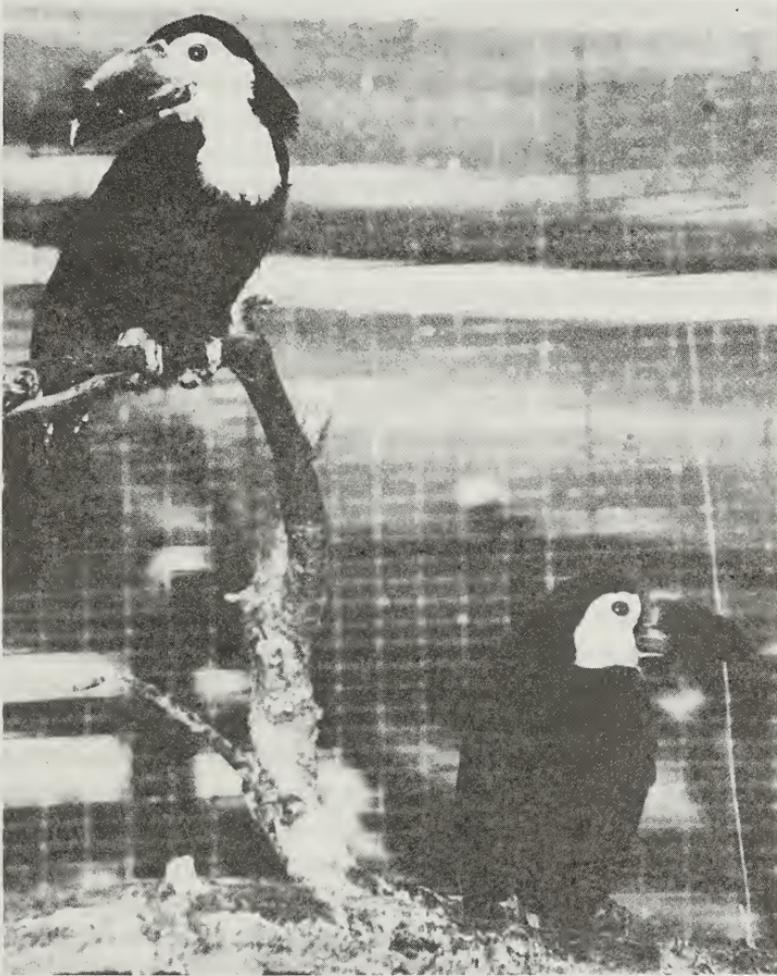
Channel-billed Toucans *Ramphastos vitellinus* are handsome medium-sized Ramphastids which originate from Trinidad, Venezuela, the Guyanas and north and east Brazil. Channel-billed Toucans belong to a species group that also includes Citron-throated Toucans *Ramphastos citreolaemus*, and Yellow-ridged Toucans *Ramphastos ariel* which according to different taxonomic authorities are variously accorded specific or subspecific status. We follow Meyer de Schauensee (1970) in treating each of these as a full species.

These closely related Toucans are distinguished by differences in bill colour and pattern, in the colour of their facial skin, and that of the bib which extends down from the face to the upper breast, and in the colour of their rump and crissum. In the Channel-billed Toucan the bill is largely black relieved by pale blue at the base, the bare facial area is pale blue and the bib is white near the face graduating into yellow on the throat and upper breast. A broad red band separates the bib from the black lower breast and the rump and crissum are red. This detailed description is given to assist in avoiding confusion between this and closely related species.

Confusion in nomenclature abounds in the avicultural literature; for example Rutgers and Norris (1977) give *Ramphastos vitellinus* the common names of Sulphur or White-breasted Toucan and refer to the Yellow-ridged Toucan *Ramphastos culminatus* as the Keel-billed or Channel-billed Toucan. This is all the more confusing in that the name Keel-billed Toucan is now most commonly used for *Ramphastos sulfuratus*, also known as the Sulphur-breasted Toucan.

Chester Zoo's breeding pair of Channel-billed Toucans comprise a female received in November 1984 and believed to have been recently imported from Guyana, and a male received in July 1988 from Paradise Park, Hayle. The birds soon settled down and became confident as sole occupants of their 6.8 x 2.6 x 3.5 m (22 ft. x 11 ft. x 13 ft.) high aviary which is situated in the upper gallery of the Tropical House. Our Toucans are fed on a diet that includes

chopped fruit, usually apple, pear, tomato and grapes sprinkled with commercial insectile food and SA37 vitamin supplement with occasional live food.



*R. Wilkinson*

Channel-billed Toucans. Two recently fledged birds;  
the first to be bred at Chester Zoo in 1989.

A grandfather clock type nest box measuring 40 cm x 40 cm x 90 cm ((16 in x 16 in x 34 in) deep with an entrance hole 10 cm (4 in) diameter was filled to within 40 cm of the hole with a mixture of peat and forest bark. To assist entry and exit of the birds a wire mesh ladder was fixed vertically to the box leading down from the hole to the base. This nest box was fixed to the back wall of the aviary and on 30th June 1989 the keeper noted that both birds were

spending considerable time inside it. The nest box was checked on 10th July when three eggs were seen. Both the male and the female took turns in incubation. On 23rd July some broken egg shell was found on the aviary floor and we suspected that at least one chick had hatched. The food consumption of the birds had greatly increased by 25th July with live food being taken into the nest box by both parents. This included mealworms, crickets, giant morio worms and locusts. The chicks were heard to call from within the box on 2nd August. Pink mice were offered in addition to the other items of live food but were ignored until 13th August when these were taken by the parents to be fed to the chicks in the nest. The appetite for live food increased markedly and by 16th August the birds were being fed ten pink mice, twenty-four large locusts, twelve giant morio worms and a handful of mealworms daily. This was in addition to the apple, pear, grapes, tomato and banana that the adults were seen to carry into the nest box.

Nest sanitation was observed on 5th September when the female was seen to emerge from the nest box with a beakful of peat which she then dropped onto the aviary floor. Both male and female cleaned the nest to such an extent that when the chicks fledged no peat or forest bark remained. A youngster fledged on 12th September, a day after it had been first seen peering out of the nest box. The female continued to carry food into the nest box from which chick calls could be heard whilst both adults became excited calling loudly and continuously after the first chick had fledged. For a period of four to five days before this first chick fledged hardly any live food was taken. A second chick fledged three days later. Pink mice were not accepted after 19th September and from then on not offered to the birds. Both chicks were first seen feeding themselves on 22nd September although the parents continued to feed them for some weeks after fledging. The bills of the fledglings were shorter than those of the adults. On fledging the chicks' bills were all black but a few days after fledging the base of the bill paled then gradually turned pale blue as in the adult. The fledglings also differed in that their yellow and red feathering was less intense than that of the adults. We also noted that on first fledging the chicks' tails were still growing with the basal portions of each rectrix still in sheath. Both chicks were reared successfully and in February 1990 were transferred to Paignton Zoo.

In 1990 the adult pair showed signs of breeding in early April when the male was observed feeding the female. By 17th April both birds were spending long periods in the nest box. A month later a

broken egg was found and that is our only record for that breeding attempt. However on 28th May it was considered that from their behaviour the Toucans had re-nested and two eggs were observed when the nest box was checked on 31st May 1990. Changes in the adults behaviour suggested that a chick or chicks had hatched on 14th June. That would indicate an incubation period of around seventeen days. At first sight this appears a very short incubation period for such a large bird but may in fact be an overestimate; Skutch (1983) quotes Bourne as giving an incubation period of only 15 ½ days for the related Red-billed Toucan *Ramphastos tucanus*.

Behaviour of the adult birds in 1990 was similar to that recorded in 1989 in that initially only a small amount of live food was taken by the adults with no interest in pink mice until the chicks were over 10 days old. The first chick fledged on 30th July followed by a second the next day. The youngest Toucan had to be removed from the parents a month later because of aggression towards it from the male. This chick died three days later but the first was successfully reared and after being surgically sexed as a female remains in our collection paired to an unrelated male.

The original breeding pair re-nested in 1991 laying the first egg of a clutch of four on 23rd April. On 2nd May two eggs were removed from the nest by the parents. Both of these contained dead embryos which had died in early incubation. The remaining two eggs were candled and proved to be fertile but when the box was checked on 15th May both were still unhatched. These were checked again and found to have also died in early incubation. The nest box was then emptied by the keepers and refilled with fresh peat and forest bark after which the Toucans soon showed interest in re-nesting.

The nest box was checked again on 3rd June 1991 when a clutch of five eggs was found. Candling these eggs indicated four to be fertile. On 11th June a hatched egg shell on the aviary floor indicated that the first chick had hatched and two days later a second egg-shell was found. Checking the nest box on 21st June revealed four chicks. On 27th June the adults were again carrying large amounts of live food. On 1st July three chicks were observed in the nest. Although there was then no sign of its remains one of the chicks must have succumbed in the previous 10 days. The chicks were naked and of an unusual grey-blue colour. On 26th July a chick was seen peering out of the nest being encouraged to fledge by both its parents. The following day two chicks had fledged followed by the third two days later on 29th July.

*R. Wilkinson*

Channel-billed Toucans at Chester Zoo. Parents with two fledglings, 1989.

Channel-billed Toucans receive their name from the groove or channel that runs below the culmen of the upper mandible along the length of the bill. We noted that, whilst our breeding male has a pronounced channel on the bill, the channel is lacking in the female and we wondered whether this difference might be an aid to sexing. Accordingly the skins of seven males and five females were examined at the British Museum, Tring. Other unsexed specimens were also examined but none were without a channel although in one specimen this was very shallow. Channel development was scored as shallow, standard or pronounced. Of the seven males two had pronounced channels, two had standard channels and three had only shallow channels. Of the five females none had pronounced channels, three had standard channels and two had shallow channels. Thus it would appear that channel development is inconsistent and that our female was eccentric in showing no sign of channel development. However measurements of the bills of the museum specimens indicated that bill length was a good guide to sex with bills consistently longer in males than females. For the seven males measured bill length ranged from 121 to 138 mm (mean = 131 mm) whilst that of the five females ranged from 98 to 116 mm (mean = 106 mm). Bill length was measured by callipers from the tip of the bill to the point along the culmen at the top of the base of the upper mandible where the bill meets the feathering of the forehead. However bill length may only be useful in sexing adult birds. We noticed that in recently fledged birds the bills were markedly shorter than those of the adults.

The breeding behaviour of Channel-billed Toucans in the wild is not well documented although Lill (1970) provides some very

useful data from two nests he studied in Trinidad. Herklots (1961) indicated that as in other Toucans, the Channel-billed Toucan nests in holes high up in trees but the nest holes found by Lill were only 3.4 m (10 ft.) and 1.1 m (4 ft.) above the ground. Lill notes that both nests were 30 to 45 cm (12 to 17½ in) deep and the holes were relatively small, each being less than 64 mm average diameter forcing the adults to "wriggle" in and out of the nest. Our nest box was filled to a level about 40 cm from the hole but the hole was rather larger being about 10 cm in diameter.

Clutch sizes over four nesting attempts of our pair at Chester were 3,2,4, and 5. Herklots (1961) quotes two as the normal clutch size but Lill (1970) recorded clutches of 4 and 3. Five seems an unusually large clutch.

Lill estimated the nestling period as being between 44 and 51 days for the one nest that successfully fledged, noting that the first value was comparable to that given by a previous author. Our observations indicated a nestling period of 52 days for the first chick in 1989, and 46 days in both 1990 and 1991. Again these agree well with periods observed in the wild. There are no records of the incubation period of Channel-billed Toucans determined from nests in the wild. Our observations suggested it may be of the order of 17 days but as previously noted this may be an over estimate.

We have been unable to find any previous records of captive breeding of Channel-billed Toucans in the U.K. although this species was bred in the USA by Rod Barth in June 1987 for which he subsequently received a U.S. First Breeding Avy Award (Thompson 1989).

#### REFERENCES

- HERKLOTS, G. A. C. (1961). *The Birds of Trinidad and Tobago*. Collins, London
- LILL, A (1970). *Nidification of the Channel-billed Toucan *Ramphastos vitellinus* in Trinidad, West Indies*. Condor 72 235-236.
- MEYER DE SCHAUENSEE, R. (1970). *A Guide to the Birds of South America*. Oliver and Boyd, Edinburgh.
- RUTGERS, A. & NORRIS, K. A. (1977). *Encyclopedia of Aviculture Vol. 3*. Blandford Press, Poole, U.K.
- SKUTCH, A. F. (1983). *Birds of Tropical America*. University of Texas Press. Austin, USA.
- THOMPSON, D. R. (1989). *1988 Avy Awards presented at 15th Annual A. F. A. Convention, Tampa*. Watchbird. Vol. XVI. No.2, 24.

## PRETRE'S AMAZON PARROT

By Rosemary Low  
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One of the least known Amazon Parrots in aviculture is Pretre's or the Red-spectacled *Amazona pretrei*. Briefly it resembles the Tucuman Amazon *A. tucumana* but the red on the head is a deeper shade and extends from the forehead to encircle the eye. The species was virtually unknown to aviculturists until the 1980s and it remains very rare. Its numbers and its range are said to be declining rapidly. It is now known to occur only in Rio Grande do Sul in the south-east of Brazil. It may also survive in adjacent parts of north-eastern Argentina. There has been a substantial decline in its numbers since the 1970s, mainly because of destruction of the *Araucaria* pine forest with which it is associated. The ripe seeds are its principal food during certain times of the year. Apparently, little virgin forest of this type now survives within its range. After the breeding season it migrates early each year from the southern part of Rio Grande do Sul to the north.



Rosemary Low

*Amazona Pretrei* - female parent.

The Tucuman Amazon, to which it is closely related, is also endangered by habitat destruction and by excessive trade, as the result of which it was placed on CITES Appendix 1 in 1989. Pretre's Amazon, however, had been placed on Appendix 1 several years previously when it was unknown in aviculture.

Although the two species are very similar in colour and size, their personalities are different. Much as I like the Tucuman, I would describe *pretrei* as one of the friendliest, most cheeky and cheerful parrots in existence! It seems inherently almost fearless but usually without the vicious streak which accompanies fearlessness in some of the larger Amazons. It is a truly delightful bird to keep. Most specimens will whistle or call out to attract attention when anyone passes the aviary. It is a small Amazon weighing between 240 gms and 310 gms and measuring 12 in (30 - 31 cm). Several books quote a greater length, even up to 35 cm - but this is incorrect.

At Palmitos Park, Gran Canaria, Pretre's Amazon is well represented in the off-exhibit breeding centre. The genus *Amazona* is the prime interest of Klaus Paulmann, the founder of Palmitos Park. He had been breeding endangered species of Amazons, such as the Cuban *A. l. leucocephala*, Yellow-shouldered *A. barbadensis* and the Tucuman, also threatened species such as the Hispaniolan *A. ventralis* and the Green-cheeked or Mexican Red-headed *A. viridigenalis* long before I joined the staff of Palmitos Park in February 1989. In 1990 the following Amazons were reared: Cuban, Hispaniolan, Yellow-lored *A. xantholora*, Lilac-crowned *A. finschi*, Yellow-shouldered, *A. barbadensis*, Double Yellow-head *A. ochrocephala oratrix* and Pretre's. All were reared by Amazons with the exception of some of the *barbadensis* and one Hispaniolan which had to be hand-reared because of a bacterial infection. In 1991 all the foregoing Amazons were reared, plus Bodin's Amazon *A. f. bodini*, Yellow-fronted *A. ochrocephala*, the rare Tres Marias *A. o. tresmariae* and the Green-cheeked *A. viridigenalis*.

Most of the *pretrei* had been flying together in a fairly large aviary for some months. They were not sexed as I was under the misapprehension that they were sexually dimorphic! They were paired up towards the end of February 1990 and we were left with what we believed to be four males. These were placed together in a breeding aviary with a nest-box. Among our group of this species were some obvious males and some obvious females but sexing is not as easy as has been suggested by some authors. Males are said to have more red on the head and wing or on the wing. I tried to assess this feature in association with the size and shape of the head and beak. Certainly some females have noticeably smaller heads and beaks and most have less red in the plumage. However, I would advise

chromosomal or surgical sexing of this species as there is always the exception which proves the rule.

And so it was for on 30th March one of the four "males" was incubating three eggs! A fourth was laid soon afterwards. It appeared that the female was paired to the most assertive male who was often displaying. The other two males were removed from the aviary. At this point it should be stated that it is easier to separate this particular male and female by behaviour, the female being more subdued, than by appearance, although the male does have marginally more extensive red on the carpal edge of the wing. We were delighted to discover that all four eggs were fertile. Nest inspection was simple, being carried out from the service passage in the next block of aviaries. One had only to tap gently on the nest-box for the female to leave. The box measures 11 in (29 cm) square and 15½ in. (40 cm) high. Wood shavings were placed in the bottom.

The aviaries are of the traditional walk-in kind, with part of the roof, one side and the front of welded mesh. On the mesh side, each aviary is divided from the next by sufficient space for flowering hibiscus which not only break up stark outlines, but create a pleasant environment. Each aviary (most of those in this block house Amazons) measures approximately 8 ft. (2.4 m) x 4 ft. (1.2 m) x 7 ft. (2.1 m) high.

On 20th April, probably 25 days after the first egg was laid, a pip mark was seen. Early in the morning of 22nd April, there was a chick in the nest, on the following morning there were two chicks. The third egg was pipping on the morning of 24th April and the chick had hatched by 3 pm the next day. The fourth egg was pipping on 26th April but the chick did not hatch until the morning of the 29th or during the previous evening. I assume the latter. It appears that the eggs hatched after 26 and 27 days incubation. Three of the four chicks were weighed on the day they hatched. Their weights varied from 10 to 12 gms depending upon the amount of food in the crop.

From hatching to about seven days *pretrei* chicks have white down which is quite dense on the back and much sparser on the head. After six days the back darkens with the feathers growing under the skin. Because of this the three oldest chicks had a grey appearance by the beginning of May; their eyes were still closed. Many of their wing feathers had erupted by 13th May. The red forehead and red carpal edge of the wing already distinguished the oldest chick as a *pretrei*.

The chicks were closed-ringed when aged between 12 and 14 days with 9.5 mm bands (internal measurement) but I realised later that 9 mm is the correct size. The young grew well and their crops were always bulging with food for the first month. After this the young were fed less frequently as is normal for Amazons. The rearing diet consisted of unlimited fresh

corn (much of it grown on the premises, along with other vegetables and fruits), the normal mixed food which consisted of sprouted sunflower, boiled maize and chopped greenfood, varied daily with cooked rice in the husk, butter beans, peas and/or chopped carrot, plus a mixture of chopped fruits and our own rearing food made from hard-boiled egg, carrot, non-fat soft cheese and wholegrain bread. They also consumed a mixture of small soaked seeds (oats, canary and hemp) and spray millet.

The rearing period was totally uneventful. By the end of May the three eldest chicks were fully feathered, the youngest nearly so. Immature plumage differs from that of adults in the following respect. The red on the crown and forehead is less extensive and only one of the four had some red feathers below the eye. The same youngster had the feathers of the forehead green, margined with red to produce a pretty scalloped effect, while in the others the feathers were solid red. The red is a ruby shade, perhaps even deeper than in the adults, unlike the Tucuman Amazon in which immature birds have the forehead orange, not brick red as in the adults. Immature *pretrei* have much less red on the wing: there is a little on the bend, little or none on the carpal edge, and red on some of the primary coverts - but much less than in an adult. The amount varied in the four young. The alula is green, not red as in adults (I think these pure red feathers are among the most beautiful of any parrot). The thighs are entirely green, whereas in adults they are partly red. The iris is pale grey (chrome yellow in adults) and the beak is ivory. In the parents it is ivory tinged with orange on the sides of the upper mandible.

The young left the nest on 9th, 12th, 13th, and 21st June. I believe that they fledged in the following order: second, third, first and fourth, after 53, 48, 49 and 55 days in the nest. Even if I am wrong and the eldest left first, it would have been after 49 days. As is usual with Amazons, they started to feed on their own within two or three days of leaving. I believe that the longer young birds can stay with their parents, the better it is for them. After all, in the wild they stay as a family unit for many months. Often this is not possible in an aviary because restricted space leads to aggressive behaviour.

Our experiences with this pair made the breeding of Pretre's Amazon seem deceptively easy - but another pair seemed determined to prove the contrary. They were housed in our new breeding centre, a fully enclosed building containing more than 100 suspended cages. The temperament of this pair is totally different from that of the calm couple who reared the young. They are extremely excitable and, uniquely among our *pretrei*, both male and female are aggressive. It is generally true that the small Amazons are easier to breed than the large ones but it is also a fact that breeding problems are more likely to arise with aggressive individuals.

There is a risk that the young will be killed on hatching. This female laid three eggs, only one of which was fertile. It hatched on 13th May. Sadly the chick was killed within minutes of hatching. The female did not nest again in 1990 but, in future, her eggs will be fostered to other Amazons, preferably *pretrei*. Several other females laid but all the eggs were infertile. It should be noted that it was a first breeding attempt for all our pairs.

However, the 1991 results were disappointing, producing a large number of infertile eggs. The previously successful pair were the only ones to produce young. The female laid the first of three eggs on 25th April and the third probably on the 30th. On 13th May they were moved to an incubator in the hope that the female would produce a second clutch. She did not. The temperament of a female *pretrei* who had laid for the first time was therefore tested. Her own eggs were infertile. She was given the pipping egg of a Finsch's Amazon two days before the first *pretrei* hatched. This chick was well cared for and nest inspection was very easy (the latter being an important requirement of foster parents). She was therefore given each *pretrei* egg the day before it hatched. The three chicks, along with the *finschi*, were reared without incident. The chicks were seldom weighed or handled because the female became very excited when this occurred, although she did not enter the nest. This female, unlike the male, reacted very aggressively towards anyone who approached the aviary. The three young, which appear to be two males and a female, left the nest on 7th, 10th and 13th July - and the *finschi* on 15th July. The latter was not fed by its foster parents and was removed to be hand-fed. Some Amazons will feed fostered chicks of a different Amazon species after they have left the nest; others will not. In future, if Amazons chicks have to be fostered, they will be removed for hand-rearing by four weeks.

Our experiences to date with this species indicate that it nests very readily but that most pairs are single-brooded, whatever the outcome of the clutch. Only a small number of Pretre's Amazons exist in aviculture, perhaps about 100. However, I believe that this species will eventually become firmly established and that it will prove to be one of the easier Amazons to breed.

\* \* \*

## VISIT TO PARKLANDS

About 90 members and their guests accepted the kind invitation of Mr and Mrs Ken Dolton to visit their home "Parklands", near Worcester, on Sunday 15th September 1991. The weather was kind and we enjoyed a very warm sunny autumn day. The extensive collection of livestock at Parklands is mainly of parrots and waterfowl plus what may be the largest private collection of tortoises in the country. The parrots were varied and contained species varying in size from the Bourkes parrakeet to the Macaws. Several aviaries had a pair plus their 1991 offspring on show. Of particular interest are the Thick-billed Parrots of which there were several pairs. Ken was in fact the first person to breed this species in this country, in 1976, and it is pleasing that they are still being bred at "Parklands". Amongst the various waterfowl were Red-breasted Geese, Swans, and both Demoiselle and Crowned Cranes. There was also a pair of White-cheeked Touracos.

The various aviaries and enclosures are set in landscaped grounds. The Doltons were able to show a picture of their house in 1966 just after it was built and the grounds freshly planted with numerous shrubs, trees etc. The grounds are now mature and a credit to our hosts. There are also various greenhouses, one containing cacti, another ferns. A lot of the plants had name tags and several members were observed taking down names with the object of obtaining these plants for themselves.

An excellent buffet lunch was provided by outside caterers and members were able to mix and exchange news, views etc. After lunch two beautiful framed colour photographs, donated by Cyril Laubscher, a member of the Society, were auctioned by David Spilsbury. The pictures were of a Blue-headed Pionus Parrot and a Fork-tailed Wood Nymph Hummingbird. The profit from the lunch, the auction and donations amounted to almost £300 for the Society's funds. We are all most grateful to Ken and Mona Dolton for inviting the Avicultural Society to their home and for their continued support. It also transpired that it was Ken's birthday as well!

Stewart Pyper

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## NEWS AND VIEWS

A Ruppell's Vulture was hatched at Whipsnade Wild Animal Park on 21st February 1991 and has been successfully reared by its parents.

\* \* \*

A recent count of the only remaining population of the Bali Starlings (Rothschild's Grackles) *Leucopsar rothschildi* in the Bali Barat National Park, Indonesia, revealed 36 - 39 birds compared with 13 - 18 in March. Good weather is partially responsible for a successful breeding season and improved site protection has also undoubtedly contributed. (*World Birdwatch*, June 1991.)

\* \* \*

Three Kakapo chicks have been reared this year on Little Barrier Island bringing the total known population of this highly endangered species to 50.

\* \* \*

The 1990/91 season's notable breedings at Taronga Zoo, Sydney, include one Satin Bower Bird, one Gang Gang Cockatoo, two Eastern Yellow Robins, two White-winged Wrens, four Superb Wrens, three Blue-faced Honeyeaters, eight Noisy Pittas, four Musk Lorikeets and four White-headed Pigeons. Recent acquisitions include Southern Figbirds and Siamese Fireback Pheasants.

\* \* \*

In April the US Fish and Wildlife Service proposed logging restrictions on nearly five million hectares of Pacific North West forests to help save the Northern Spotted Owl *Strix occidentalis caurina* in response to a federal court order. The restrictions, the most sweeping protection of wildlife in the history of the Endangered Species Act, could cost the region tens of thousands of jobs. (*Vancouver Sun*, 27th April 1991.)

\* \* \*

A Lesser Bird of Paradise *Paradisaea minor* was hatched recently at the Bronx Zoo, New York. The chick was hand-raised and is apparently the first of this rarely-kept species to be reared in this way. The protocol established for the successful hand-raising of ten Red Birds of Paradise *P. rubra* in 1988-89 was used. The Lesser Bird of Paradise lays only one egg per clutch. The hatching of this chick is of special interest because the father lacks the handsome adult plumage, being only three years old, and would normally be considered to be immature. A project is under way in which reproductive behaviour is being studied in the Red and the Lesser Bird of Paradise.

\* \* \*

An annual Foreign Bird Breeder of the Year competition has recently been sponsored by "Cage and Aviary Birds", the Foreign Bird Federation and John E. Haith Ltd. The entries for 1990 were judged by Raymond Sawyer and Martin Mogg both of whom are well known in the Avicultural Society. The overall winners were Andrew Blyth and Jonathan Powell who bred 75 Lories and Lorikeets of nineteen species including Duivenbode's, Yellow-streaked, Red, Black-winged, Blue-streaked, Green-naped, Forsten's Edward's, Swainson's, Ornate, Meyer's, Perfect, Goldie's, Dusky, Chattering, Stella's, Fairy and Red-spotted. Most of the young birds were reared by their parents but some were removed from the nests for hand-rearing when they were 2 - 6 weeks old. The runner-up in the section for Parrots was S. McDermid, a member of this Society, who bred Goldie's, Stella's, Red, Green-naped, Chattering and Musschenbrock's Lorikeets in addition to two Desmarest's Fig Parrots. All of his birds were parent-reared. The breeding of numerous Gouldian, Diamond, Firetail, Cuban, Bicheno, Heck's Longtailed, Crimson and Painted Finches was reported by C. Wellings and that of the Copper Sunbird by A. Ridd for which they were awarded first prizes in the Seedeater and Softbill sections respectively. Other interesting breedings included those of several species of Waxbill and Mannikin (N. and G. Savoury), Celebes King Starlings (T. Broderick), eight species of Quail, Spotted, Imperial and pink-necked Green Pigeons (C. Garnham) and Chestnut-flanked and Yellow Zosterops and Silver-eared Mesias (Mr. and Mrs. A. J. Lee). Chester Zoo was the winner in the Zoo and Bird Garden category with the breedings described by Dr. Roger Wilkinson, in Part 3 of this year's Avicultural Magazine and

Paulton Park, Romsey, Hants came second with their successful breedings of many species of waterfowl and pheasant, Lesser Hill Mynahs, Black-headed Caiques and Goffin's Cockatoos.

\* \* \*

Twenty years ago the Mauritius Kestrel was considered to be the world's rarest bird with only four known survivors. However, a conservation programme devised and performed by the Jersey Wildlife Preservation Trust, the Government of Mauritius and the World Centre for Birds of Prey in the U.S. has saved it from extinction and provided a glowing example of the potential role of aviculture in the conservation of endangered species. A captive breeding programme in Mauritius, organised by Carl Jones a Mauritius resident employed by the Trust, was begun just over ten years ago and has resulted in the release into the wild of 120 birds reared in captivity. The programme will continue until the optimum number of wild breeding pairs had been established. In the meantime, two pairs of these beautiful birds have been placed by the Government of Mauritius on loan to the Trust at Jersey where the first European breeding of this very rare falcon occurred in June of this year.

\* \* \*

Alan Lieberman (Curator of Birds, San Diego Zoo) has submitted for publication in the Avicultural Magazine detailed tables summarising the Zoo's remarkable breeding results during 1989 and 1990. The tables state whether the birds were parent-reared or hand-reared, their sex if known (usually determined in non-survivors during post-mortem examination) and the numbers which did not survive for 30 days. I have calculated the numbers which did survive and these are given in the following lists.

Ed.

### 1989

Eastern Emu	<i>Dromaius n. novaehollandiae</i>	37
Mantell's Brown Kiwi	<i>Apteryx australis mantelli</i>	1
African cattle egret	<i>Ardeola ibis</i>	2
Little Blue Heron	<i>Hydranassa caerulea</i>	5

Hamerkop	<i>Scopus umbretta</i>	3
Milky Stork	<i>Mycteria cinerea</i>	4
Scarlet Ibis	<i>Eudocimus ruber</i>	3
Hadada Ibis	<i>Hagedashia hagedash nilotica</i>	1
Puna Ibis	<i>Plegadis ridwayi</i>	2
Ne-Ne	<i>Branta sandvicensis</i>	1
N.Red-billed Whistling Duck	<i>Dendrocygna a. autumnalis</i>	5
Cape Teal	<i>Anas capensis</i>	2
Hottentot Teal	<i>Anas punctata</i>	15
Cape Shoveler	<i>Anas smithi</i>	2
So. African Black Duck	<i>Anas s. sparsa</i>	6
Ringed Teal	<i>Callonetta leucophrys</i>	12
Old World Comb Duck	<i>Sarkidiornis m. melanotos</i>	1
California Condor	<i>Gymogyps californianus</i>	4
Andean Condor	<i>Vultur gryphus</i>	4
African Pigmy Falcon	<i>Polihierax semitorquatus</i>	7
Black Curassow	<i>Crax alector</i>	3
Congo Peacock	<i>Afropavo congensis</i>	1
Philby's Rock Partridge	<i>Alectoris philbyi</i>	34
Arabian Sand Partridge	<i>Ammoperdix heyi intermedia</i>	16
Golden Pheasant	<i>Chrysolophus pictus</i>	22
Palawan Peacock Pheasant	<i>Polyplectron emphanum</i>	15
Elliot's Pheasant	<i>Syrmaticus ellioti</i>	13
Temminck's Tragopan	<i>Tragopan temminckii</i>	21
Manchurian Crane	<i>Grus japonensis</i>	1
Grey-winged Trumpeter	<i>Psophia crepitans</i>	13
Grey-necked Wood Rail	<i>Aramides cajanea</i>	2
Sun Bittern	<i>Eurypypa helias</i>	2
Crested Seriema	<i>Cariama cristata</i>	3
Buff-crested Bustard	<i>Lophotis ruficrista</i>	5
Cream-colored Courser	<i>Cursorius c. cursor</i>	3
Crowned Lapwing	<i>Vanellus coronatus</i>	2
Red-wattled Lapwing	<i>Vanellus indicus</i>	8
Inca Tern	<i>Larosterna inca</i>	2
Nicobar Pigeon	<i>Caloenas n. nicobarica</i>	10
Green-winged Dove	<i>Chalcophaps i. indica</i>	4
Speckled Pigeon	<i>Columba guinea</i>	31
So. African Speckled Pigeon	<i>Columba guinea phaenota</i>	2
Nutmeg Pigeon	<i>Ducula b. bicolor</i>	5

Celebes Quail Dove	<i>Gallicolumba tristigmata</i>	1
Diamond Dove	<i>Geopelia c. cuneata</i>	4
Black-winged Ground Dove	<i>Metriopelia melanoptera</i>	2
Crested Pigeon	<i>Ocyphaps lophotes</i>	1
Green-naped Pheasant Pigeon	<i>Otidiphas n. nobilis</i>	6
Jambu Fruit Dove	<i>Ptilinopus jambu</i>	2
Black-naped Fruit Dove	<i>Ptilinopus m. melanospila</i>	1
Beautiful Fruit Dove	<i>Ptilinopus pulchellus</i>	1
Superb Fruit Dove	<i>Ptilinopus superbus</i>	3
Red-eyed Dove	<i>Streptopelia semitorquata</i>	1
Galapagos Dove	<i>Zenaida galapagoensis</i>	6
Duyvenbodes Lory	<i>Chalcopsitta</i>	
	<i>d. duivendodei</i>	3
Stella's Lory	<i>Charmosyna</i>	
	<i>papou stellae</i>	5
Black-winged Lory	<i>Eos cyanogenia</i>	3
Dusky Lory	<i>Pseudeos fuscata</i>	2
Red-collared Lory	<i>Trichoglossus haematodus</i>	
	<i>rubritorquis</i>	2
Ornate Lory	<i>Trichoglossus ornatus</i>	1
Tahitian Lory	<i>Vini peruviana</i>	1
Citron-crested Cockatoo	<i>Cacatua sulphurea</i>	
	<i>citrinocristata</i>	1
Slender-billed Cockatoo	<i>Cacatua t. tenuirostris</i>	5
W. Red-tailed Black Cockatoo	<i>Calyptorhynchus</i>	
	<i>magnificus naso</i>	2
Rose-breasted Cockatoo	<i>Eolophus roseicapillus</i>	11
Amboina King Parrot	<i>Alisterus a. amboinensis</i>	3
Yellow-headed Amazon	<i>Amazona ochrocephala</i>	
	<i>oratrix</i>	2
Hyacinth Macaw	<i>Anodorhynchus</i>	
	<i>hyacinthinus</i>	1
Blue and Gold Macaw	<i>Ara ararauna</i>	1
Golden Conure	<i>Aratinga guarouba</i>	4
Cloncurry Parrakeet	<i>Barnardius</i>	
	<i>b. macgillivrayi</i>	3
Blue-crowned Hanging Parrot	<i>Loriculus galgulus</i>	2
Blue-winged Parrakeet	<i>Neophema chrysostoma</i>	1
Northern Rosella	<i>Platycercus venustus</i>	2
Rock Peplur	<i>Polytelis anthopeplus</i>	4
Hooded Parrakeet	<i>Psephotus c. dissimilis</i>	2

Derbyan Parakeet	<i>Psittacula derbiana</i>	2
Desmarests Fig Parrot	<i>Psittaculirostris</i> <i>d. desmarestii</i>	1
Edwards Fig Parrot	<i>Psittaculirostris</i> <i>edwardsii</i>	2
Timneh Parrot	<i>Psittacus e timneh</i>	3
Red-capped Parrot	<i>Purpureicephalus spurius</i>	4
Thickbilled Parrot	<i>Rhynchopsitta p. pachyrhyncha</i>	2
Grey Go-away Bird	<i>Corythaixoides c. concolor</i>	2
Lady Ross Plaintain-eater	<i>Musophaga rossae</i>	6
Red-crested Turaco	<i>Tauraco erythrolophus</i>	5
Spectacled Owl	<i>Pulsatrix p. perspicillata</i>	4
Southern Kookaburra	<i>Dacelo n. novaeguinae</i>	3
Abyssinian Ground Hornbill	<i>Bucorvus abyssinicus</i>	5
Luzon Tarictic Hornbill	<i>Penelopides panini manillae</i>	5
Double-toothed Barbet	<i>Lybius bidentatus</i>	5
Bearded Barbet	<i>Lybius dubius</i>	4
Crested Barbet	<i>Trachyphonus v. vaillantii</i>	14
Common Shama Thrush	<i>Copsychus malabaricus</i>	9
White-browed Robin Chat	<i>Cossypha heuglini</i>	2
Blue Whistling Thrush	<i>Myiophaneus caeruleus</i>	6
Ground Scraper Thrush	<i>Turdus litsipsirupa</i>	3
White-throated Laughing Thrush	<i>Garrulax albogularis</i>	1
Black-throated Laughing Thrush	<i>Garrulax chinensis</i>	3
Red-winged Laughing Thrush	<i>Garrulax formosus</i>	2
Red-tailed Laughing Thrush	<i>Garrulax milnei</i>	6
Spotted Laughing Thrush	<i>Garrulax ocellatus</i>	1
White-browed Laughing Thrush	<i>Garrulax sannio</i>	6
White-necked Laughing Thrush	<i>Garrulax strepitans</i>	6
Formosan Yuhina	<i>Yuhina brunneiceps</i>	1
Green Honeycreeper	<i>Chlorophanes spiza</i>	3
Black-faced Dacnis	<i>Dacnis lineata</i>	2
Golden-masked Tanager	<i>Tangara larvata</i>	9
Orange-breasted Waxbill	<i>Amandava subflava</i>	1

Red-cheeked Cordon-bleu	<i>Uraeginthus bengalus</i>	6
Blue-capped Cordon-bleu	<i>Uraeginthus cyanocephala</i>	1
Golden-crested Mynah	<i>Ampeliceps coronatus</i>	6
Celebean Mynah	<i>Basilornis celebensis</i>	5
Emerald Starling	<i>Lamprotornis iris</i>	6
Rothschild's Mynah	<i>Leucopsar rothschildi</i>	7
Golden-breasted Mynah	<i>Mino anais orientalis</i>	7
Grosbeak Starling	<i>Scissirostrum dubium</i>	9
Superb Starling	<i>Spreo superbus</i>	4
Asiatic Azure-winged Magpie	<i>Cyanopica cyana swinhoei</i>	6

### 1990

Mantell's Brown Kiwi	<i>Apteryx australis mantelli</i>	2
Milky Stork	<i>Mycteria cinerea</i>	5
Goliath Heron	<i>Ardea Goliath</i>	2
Hermit Ibis	<i>Geronticus eremita</i>	9
Hadada Ibis	<i>Hagedashia hagedash nilotica</i>	2
E. Indian Wandering Whistl. Duck	<i>Dendrocygna arcuata arcuata</i>	9
N. Red-billed Whistling Duck	<i>Dendrocygna autumnalis autumnalis</i>	3
White-faced Whistling Duck	<i>Dendrocygna viduata</i>	6
Hottentot Teal	<i>Anas punctata</i>	21
Ringed Teal	<i>Callonetta leucophrys</i>	1
Red-crested Pochard	<i>Netta rufina</i>	2
North American Ruddy Duck	<i>Oxyura jamaicensis jamaicensis</i>	3
Falcated Duck	<i>Anas falcata</i>	3
Old World Comb Duck	<i>Sarkidiornis m. melanotos</i>	8
Swan Goose	<i>Anser cygnoides</i>	1
Black-necked Swan	<i>Cygnus melanocoryphus</i>	1
Andean Condor	<i>Vultur gryphus</i>	3
California Condor	<i>Gymnogyps californianus</i>	4
King Vulture	<i>Sarcophamphus papa</i>	3
Hooded Vulture	<i>Necrosyrtes monachus</i>	1
African Pigmy Falcon	<i>Polihierax semitorquatus</i>	8
Yellow-knobbed Curassow	<i>Crax daubentoni</i>	1
Bare-faced Curassow	<i>Crax fasciolata fasciolata</i>	2

Crested Guan	<i>Penelope purpurascens</i> <i>purpurascens</i>	1
Arabian Red-legged Partridge	<i>Alectoris melanocephala</i> <i>melanocephala</i>	8
Philby's Rock Partridge	<i>Alectoris philbyi</i>	74
Arabian Sand Partridge	<i>Ammoperdix heyi intermedia</i>	18
Crested Wood Partridge	<i>Rollulus roulroul</i>	2
Ferruginous Wood Partridge	<i>Caloperdix oculea</i>	4
Golden Pheasant	<i>Chrysolophus pictus</i>	16
Blue Eared Pheasant	<i>Crossoptilon auritum</i>	11
Himalayan Impeyan Pheasant	<i>Lophophorus impeyanus</i>	1
Palawan Peacock Pheasant	<i>Polyplectron emphanum</i>	4
Cabot's Tragopan	<i>Tragopan caboti</i>	1
Temminck's Tragopan	<i>Tragopan temminckii</i>	10
Vulturine Guinea-fowl	<i>Acryllium vulturinum</i>	7
Guam Rail	<i>Rallus owstoni</i>	4
Manchurian Crane	<i>Grus japonensis</i>	1
Sun Bittern	<i>Eurypyga helias</i>	1
Buff-crested Bustard	<i>Lophotis ruficrista</i>	2
Cream-colored Courser	<i>Cursorius c. cursor</i>	5
Red-wattled Lapwing	<i>Vanellus indicus</i>	14
California Least Tern	<i>Sterna albifrons browni</i>	1
Nicobar Pigeon	<i>Caloenas nicobarica</i> <i>nicobarica</i>	5
Ashy Wood Pigeon	<i>Columba pulchricollis</i>	1
Squatter Pigeon	<i>Petrophassa scripta</i>	4
Nutmeg Pigeon	<i>Ducula bicolor bicolor</i>	3
Picui Dove	<i>Columbina picui picui</i>	18
Wonga Pigeon	<i>Leucosarcia melanoleuca</i>	2
Bare-faced Ground Dove	<i>Metriopelia ceciliae ceciliae</i>	1
Black-winged Ground Dove	<i>Metriopelia melanoptera</i>	7
Green-naped Pheasant Pigeon	<i>Otidiphas nobilis nobilis</i>	6
Orange-bellied Fruit Dove	<i>Ptilinopus iozonus</i>	1
Beautiful Fruit Dove	<i>Ptilinopus pulchellus</i>	4
Jambu Fruit Dove	<i>Ptilinopus jambu</i>	2
Superb Fruit Dove	<i>Ptilinopus superbus</i>	3
Philippine Turtle Dove	<i>Streptopelia bitorquata</i> <i>dusumierei</i>	3

Red-eyed Dove	<i>Streptopelia semitorquata</i>	9
White-faced Cuckoo Dove	<i>Turacoena manadensis</i>	3
Galapagos Dove	<i>Zenaida galapogoensis</i>	6
Stella's Lory	<i>Charmosyna papou stellae</i>	2
Black-winged Lory	<i>Eos cyanogenia</i>	2
Red-collared Lory	<i>Trichoglossus haematodus</i> <i>rubritorquis</i>	3
Tahitian Lory	<i>Vini peruviana</i>	3
W. Red-tailed Black Cockatoo	<i>Calyptorhynchus magnificus</i> <i>naso</i>	2
Slender-billed Cockatoo	<i>Cacatua t. tenuirostris</i>	4
Rose-breasted Cockatoo	<i>Eolophus roseicapillus</i>	8
Scarlet Macaw	<i>Ara macao</i>	2
Hyacinth Macaw	<i>Anodorhynchus hyacinthinus</i>	4
Blue and Gold Macaw	<i>Area ararauna</i>	5
Australian King Parrakeet	<i>Alisterus scapularis scapularis</i>	4
Golden Conure	<i>Aratinga guarouba</i>	7
Hooded Parrakeet	<i>Psephotus c. dissimilis</i>	8
Derbyan Parrakeet	<i>Psittacula derbiana</i>	3
Desmarests Fig Parrot	<i>Psittaculirostris d. desmarestii</i>	3
Red-capped Parrot	<i>Purpureicephalus spurius</i>	2
Thickbilled Parrot	<i>Rhynchopsitta</i> <i>p. pachyrhyncha</i>	3
Blue-naped Mousebird	<i>Colius macrourus</i>	2
Southern Kookaburra	<i>Dacelo n. novaeguinae</i>	3
Indian Roller	<i>Coracias benghalensis indica</i>	2
Concave-casqued Hornbill	<i>Buceros bicornis</i>	1
Abyssinian Ground Hornbill	<i>Bucorvus abyssinicus</i>	6
Luzon Tarictic Hornbill	<i>Penelpides panini manillae</i>	1
African Grey Hornbill	<i>Tockus nasutus</i>	3
Double-toothed Barbet	<i>Lybius bidentatus</i>	2
Crested Barbet	<i>Trachyphonus v. vaillantii</i>	4
White-browed Robin Chat	<i>Cossypha heuglini</i>	4
Ground Scraper Thrush	<i>Turdus litsipsirupa</i>	4
Black-throated Laughing Thrush	<i>Garrulax chinensis</i>	3
Yellow-bellied Laughing Thrush	<i>Garrulax galbanus</i>	5
White-browed Laughing		

Thrush	<i>Garrulax sannio</i>	3
White-necked Laughing Thrush	<i>Garrulax strepitans</i>	5
Chestnut-backed Scimitar- billed Babbler	<i>Pomatorhinus montanus</i>	1
White-headed Buffalo Weaver	<i>Dinemellia dinemelli</i>	3
Green Honeycreeper	<i>Chlorophanes spiza</i>	4
Yellow-throated Euphonia	<i>Euphonia hirundinacea</i>	3
Violaceous Euphonia	<i>Euphonia violacea</i>	1
Silver-throated Tanager	<i>Tangara icterocephala frantzii</i>	1
Golden-masked Tanager	<i>Tangara larvata</i>	4
Golden-crested Mynah	<i>Ampeliceps coronatus</i>	11
Celebes Mynah	<i>Basilornis celebensis</i>	3
Rothschild's Mynah	<i>Leucopsar rothschildi</i>	4
Grosbeak Starling	<i>Scissirostrum dubium</i>	5
Jerdon's Starling	<i>Sternus burmannicus</i>	1

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## BOOK REVIEW

*Encyclopedia of Animals. Birds.* Consultant editor, Joseph Forshaw. 1991, Merehurst Press, Ferry House, 51/57 Lacy Road, London, SW15 1PR. Price £25.00

This is a well-produced book containing hundreds of magnificent photographs and original paintings. It is written by a panel of internationally well-known ornithologists. The first part of the book consists of comprehensive, lucid chapters on general aspects of the natural history of birds including Taxonomy, Evolution, Behaviour and Habitat. There is also a very interesting one by Alison Smitherfield on Endangered Species in which she presents a thoughtful and fascinating account of the various factors which lead to the extinction of species and how they may possibly be avoided. The remainder of the book is devoted to systematically-arranged, well-illustrated descriptions of the various kinds of bird. There is not enough space in a couple of hundred pages to make every chapter comprehensive and, consequently, many species of particular avicultural interest (e.g. parrot finches, lovebirds, parakeets of the genus *Neophema*) are hardly mentioned. Particular emphasis is placed throughout on conservation and at the beginning of every chapter of the second part of the book there is a relevant selection from the ICBP list of threatened species (none of which, except some parrots, has ever been a common avicultural subject!) This attractive, beautifully illustrated and interesting book would make an excellent present for a young person anxious to learn about the wonderful world of birds.

J. R. H.

\* \* \*

## VIDEO REVIEWS

*An introduction to Garden Birds of South Africa* VHS Video (PG OII) with bird calls by courtesy of Len Gilliard. An accompanying leaflet *Gardening For Birds* by Geoff Nichols, lists the types of plants which attract birds to a garden. LLA Productions (PTY) Ltd.

Members, especially seedeater and softbill enthusiasts, should be delighted by this new video which features just over 60 species. These are categorised according to their food: seedeaters, fruiteaters, etc. There is a lot of good advice about ways of attracting birds to gardens, including natural food sources and putting out food, e.g. bread soaked in milk and sprinkled with sugar, and cooked 'meallie' (maize!) meal for seedeaters, home-made nectar for sunbirds and, most interesting to me the provision of bone meal to attract insectivorous species.

Small seedeaters featured include the Blue or Blue-breasted Waxbill, the 'Common', or as aviculturists more often call it, the St. Helena Waxbill, Bronze Mannikin, Pin-tailed Whydah, and the Green Singing Finch (in South Africa called the Yellow-eyed Canary), Bully, Forest and Streaky-headed Canaries. There are also good shots of weavers, some at their nests, and the gorgeous Red Bishop or Orange Weaver. The male Cape Sparrow looks an attractive little fellow. Four members of the Pigeon family complete the seedeaters.

Fruit, whether growing in a garden, or put out specially for birds, attracts a rich variety of species. A rural garden in the bush veld with a fruiting fig tree, may, viewers are told, be visited by Violet-backed Starlings (there called the Plum-coloured). Another garden visitor is the Cape Glossy Starling. Four species of bulbuls are shown. There are nice shots of the Black-collared Barbet eating an apple, Levaillant's or the Crested species is shown, and my favourite is the little Golden-rumped Tinkerbird at its nest-hole. Some like mousebirds and the introduced Indian Myna, Common in Natal, are not always welcome where fruit is grown.

Water for drinking and bathing also proves a great attraction. I recall in Kenya on a visit to a suburban garden outside Nairobi, being thrilled to see a Hartlaub's Touraco come down to the bird bath. In this video there is a Purple-crested Touraco or Lourie at a bird bath. This bird's beauty is for me, rivalled only by the striking Black-headed Oriole shown later.

I love the idea of having the Malachite Sunbird come to the garden to sip nectar and, I expect, snap-up insects from the flowers, as happens in gardens in the Natal Drakenbergs, and enjoyed seeing the Greater and Lesser Double-collared Sunbirds, the Amethyst or Black, the White-

bellied species and the flowers and butterflies.

If the garden has thick cover the commentator explains, it may be home to the Cape Robin (Chat) which ventures out at dawn and dusk while the Chorister Robin is more often heard than seen. In South Africa and on the commentary called Robins, elsewhere they are usually called Robin Chats. The Natal Robin occurs in gardens on the east coast. Less shy are the Kurrichane and Olive Thrushes.

A lawn is also a popular feeding place for the Hoopoe. Other insectivorous species featured included the Red-billed or Green Wood Hoopoe, the Cardinal Woodpecker and Paradise Flycatcher. On this video the largest species and one which may seem an unlikely garden visitor is the Hadada Ibis.

*An introduction to the Birds of Southern Africa.* VHS Video (PG006) with bird sounds by courtesy of Len Gilliard. An accompanying leaflet lists all the species shown. LLA Productions (PTY) Ltd.

This video came to me having been I was told, three weeks in the top selling position in South Africa, and was the winner of the 1990 National Television Association Gold Medal for the best documentary produced there that year. The script writer received a Special Merit Award for her research for this programme.

The twenty-six Orders of birds found in southern Africa are presented in more or less the same sequence as that followed in the authoritative bird books of the region. The name of each Order is carefully pronounced, that name is shown on the screen and the characteristics of the birds in that Order are described with words and pictures. Much is made of describing the different Orders. Too much I feel. I would like to have learnt more about the individual species. Also the commentary is I feel too slow and 'dry' and academic in tone and would have benefited from a lighter touch. Many if not most of us have available a wide choice of wildlife programmes on TV and are accustomed to a very slick style of presentation. Too often that seems to be treated as more important than the content. This presentation though could easily have moved along more quickly and been more lively and entertaining without becoming superficial.

Much of the video footage is excellent and I enjoyed seeing it, some looks to be of birds in collections, a few of the birds, e.g. the Cape Parrot and Rosy- or Peach-faced Lovebird are obviously in aviaries and, I think, I spotted a few stuffed birds!

As twenty-five of the Orders consist of Non-Passerines (from the Ostrich to the woodpeckers, the Red-throated Wryneck and barbets), this video is devoted mainly to them, with Passerines (Perching Birds) given

somewhat cursory treatment at the end. I would like it to have dwelt less on some of the larger species, particularly the more familiar ones, and given extra time to the smaller birds, e.g. it would have been nice to see more of species such as the Forest Weaver, Spotted Thrush and the Cape Sugarbird and Cape White-eye. Some, especially the smaller birds, are not named on the commentary, which is unhelpful for those without a good knowledge of African birds. The accompanying leaflet however lists all the birds, just over 150 species, in the sequence in which they appear. Included also is each species' number in Ian Sinclair's *Field Guide to the Birds of Southern Africa*, which follow those in the 'new' revised Roberts' *Birds of South Africa*.

It is hoped to find overseas outlets for these videos, in the meantime they are available from LLA Productions (PTY) Ltd., P.O. Box 22174, Glenashley 4022, South Africa. Price £12.50 each plus £2.50 each packing and air mail postage (to Britain).

M.E.

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**INDEX & LIST OF CONTRIBUTORS**

VOLUME 96 - 1990

VOLUME 97 - 1991

## INDEX TO VOLUME 96 - 1990

<i>Amazona f. farinosa</i> , breeding...	126
<i>Amazona kawalli</i> , new species described	190
<i>Aratinga guarouba</i> , in field and aviary	82
Bluebird, Fairy, breeding	123
Bunting, Cinnamon-breasted, breeding	20
South African, feeding and breeding in captivity	184
Bustard, Great Indian, growth and development	133
<i>Cacatua goffini</i> , breeding	171
<i>Caloenas n. nicobarica</i> , successful breeding	130
Chacalaca, Rufous-headed, breeding	174
Chester Zoo, 1987-1989 observations	63
China, notes on man/bird relations	162
<i>Choriotis nigriceps</i> , growth and development	133
<i>Ciconia ciconia</i> , an overview	105
Cockatoos, Island, conservation appeal	54
Goffin's, breeding	171
Conure, Golden or Queen of Bavaria's, in field and aviary	82
<i>Coracopsis vasa</i> , breeding and behaviour	115
<i>Cosmopsarus regius</i> , breeding	89
Dove, Black-naped Fruit, husbandry and propagation	178
<i>Embiriza tahapisi</i> , breeding	20
<i>Embiriza species</i> , feeding and breeding	184
<i>Eos squamata obiensis</i> , breeding	24
<i>Estrilda nonnula</i> , keeping and breeding	181
<i>Estrilda spp</i> , inheritance and loss of straw display	141
Falcons, hybrids as trained birds	152
Finch, Estrildid, inheritance and loss of straw display	141
<i>Halcyon sancta</i> , breeding	10
<i>Halcyon s. smyrnensis</i> , successful propagation	2
<i>Halcyon a. albiventris</i> , successful propagation...	5
<i>Halcyon c. cinnamomina</i> , successful propagation	6
Hornbill, African Grey, breeding	167
Indonesian Zoos and Bird Markets	50
<i>Irena puella</i> , breeding	123
Kingfisher, propagation of <i>Halcyon spp.</i>	1
Brown-hooded	5
Micronesian.	6
New Zealand Sacred, breeding	10
White-breasted	2

Lory, Wallace's breeding	... .. 24
Mystery Birds, a selection	... .. 30
<i>Ortalis erythroptera</i> , breeding	... .. 174
Parrot, African Grey, response to newly hatched chicks	... .. 160
Amazon, new species described	... .. 190
Greater Vasa, breeding and behaviour	... .. 115
Mealy Amazon, breeding	... .. 126
<i>Phasianus colchicus</i>	... .. 41
Pheasant, Common, notes on	... .. 41
Pigeon, Nicobar, successful propagation using homing pigeons as surrogate parents	... .. 130
<i>Ptilinopus melanospita</i> , husbandry and propagation	... .. 178
<i>Psittacus erithacus</i>	... .. 160
San Diego Zoo, bird species bred in 1989	... .. 188
Seedeaters, Mennell's or Black-eared	... .. 76
<i>Serinus mennelli</i>	... .. 76
Softbills, British imports, part 3	... .. 192
Starling, Royal, breeding	... .. 89
Stork, White, an overview	... .. 105
<i>Tockus nasutus epirhinus</i> , breeding	... .. 167
Tracy Aviary, Utah, USA	... .. 92
Waxbill, Black-crowned, keeping and breeding	... .. 181

\* \* \*

## LIST OF CONTRIBUTORS TO VOLUME 96 - 1990

- ARNOLD, Kenneth see BRICKELL, Neville &
- ARTMAN, Andreas  
 Successful Breeding of the Rufous-headed Chachalaca  
*Ortalis erythroptera* ... .. 174
- BAPTISTA, Luis F. & HORBLIT, Helen M.  
 The inheritance and loss of the straw display  
 in *Estrildid* Finches ... .. 141
- BARNICOAT, F.C.  
 The Black-eared or Mennell's Seedeater ... .. 76
- BELL, Kevin J. & SEIBELS, Robert  
 A visit to some Indonesian zoos and bird markets ... .. 50
- BLACKWELL, Dr. Alison  
 The White Stork: A capsule overview of its status in the wild  
 and the role of captive-reared and bred birds  
 in re-introduction ... .. 105
- BOHMKE, Bruce W.  
 Husbandry and propagation of the Black-naped Fruit Dove,  
*Ptilinopus melanospila*, at the St. Louis Zoo, USA ... .. 178
- BOSWALL, Jeffery  
 Further notes on man/bird relations in China ... .. 162
- BRICKELL, Neville & ARNOLD, Kenneth  
 The feeding and breeding of Southern African Buntings  
 in captivity and in the wild ... .. 184
- BUNNELL, Dr. Sterling  
 Characteristics of captive-bred hybrid falcons  
 as trained birds ... .. 152
- CALLAGHAN, Eric  
 Breeding the Cinnamon-breasted Bunting ... .. 20

## CALLIGAN, Eric

The response of an African Grey Parrot to newly-hatched chicks... ..160

## COOKE, Dulcie

The breeding and parent-rearing of *Eos squamata obiensis*, popularly known as Wallace's Lory ... .. 24

## GOODWIN, Derek

Notes on the Common Pheasant ... .. 41

## GOUDSWAARD, R

Breeding the New Zealand Sacred Kingfisher *Halcyon sancta* at Wellington Zoo... ..10

## HAYE, Lorayne

The Captive Breeding of Blue-backed Fairy Bluebirds *Irena puella* at the San Diego Zoo ... ..123

## HORBLIT, Helen M. see BAPTISTA, Luis F. &amp;

## KUEHLER, Cyndi see LIEBERMAN, Alan, TOONE, William &amp;

## LANTERMAN, Dr. Werner

Breeding the Mealy Amazon *Amazona farinosa farinosa* at Obverhausen Ornithological Institute ... ..126

## LIEBERMAN, Alan, TOONE, William &amp; KUEHLER, Cyndi

Bird species bred during 1989 at the Zoological Society of San Diego, California, USA. ... .. 189

## LINDHOLM III, Joseph

The Tracy Aviary, Salt Lake City, Utah, USA. ... .. 92

## LOW, Rosemary

New species of Amazon Parrot described ... ..190

## MANAKADAN, Ranjit, &amp; RAHMANI, Asad R

Growth and Development of a captive Great Indian Bustard *Choriotis nigriceps* chick ... ..133

- McLEOD, Wayne see WILKINSON, Dr. Roger &
- OEHLER, David A.  
 Successful propagation of three *Halcyon* Kingfisher  
 species at Cincinnati Zoo ... .. 1  
 Successful propagation of Nicobar Pigeons  
*Caloenas n. nicobarica* using homing pigeons  
 as surrogate parents ... .. 130
- RAHMANI, Asad R. see MANAKADAN, Ranjit &
- RISDON, Donald  
 Breeding the Royal Starling (*Cosmopsarus regius*) ... .. 89
- SCHULTE, E.G.B.  
 Breeding Goffin's Cockatoo, 1974-1989 *Cacatua goffini* ... 171
- SEIBELS, Robert see BELL Kevin J. &
- SHUKER, Dr. Karl P.N.  
 A selection of mystery birds ... .. 30
- SILVA, Tony  
 The Golden Conure in Field and Aviary ... .. 82
- TODD III, William  
 Island Cockatoos: A conservation appeal to aviculturists ... 54
- TOONE, William see LIEBERMAN Alan & KUEHLER, Cyndi
- TROLLOPE, Jeffery  
 British Softbill imports part 3 *Turdidae* to *Eurylaimidae* ... 192
- WALLIS, R.  
 Keeping and breeding the Black-crowne Waxbill  
*Estrilda nonnula* ... .. 181
- WILKINSON, Dr. Roger  
 Chester Zoo 1987 - 1989: Some observations on  
 bird-rearing and arrivals to the collection ... .. 63

WILKINSON, Dr. Roger

Notes on the breeding and behaviour of

Greater Vasa Parrots *Coracopsis vasa*

at Chester Zoo ... .. 115

WILKINSON, Dr. & McLEOD, Wayne

Breeding the African Grey Hornbill

*Tockus nasutus epirhinus* at Chester Zoo ... .. 167

\* \* \*

## INDEX TO VOLUME 97 - 1991

<i>Amazona pretrei</i> , breeding ... ..	185
<i>Apteryx australis</i> , breeding ... ..	59
<i>Aratinga chloroptera</i> , breeding ... ..	74
<i>Bycanistes bucinator</i> , breeding ... ..	67
<i>Chalcopsitta d. duivenbodei</i> , breeding ... ..	37
<i>Charmosyna josefinae</i> , breeding ... ..	167
<i>Charmosyna placentis</i> , breeding ... ..	3
<i>Charmosyna r. rubronotata</i> , breeding ... ..	130
Chester Zoo, notes - 1990 ... ..	147
<i>Chloebia gouldiae</i> ... ..	92
Chough, The Cornish; Past, present and future ... ..	51
<i>Cinnyricinthus leucogaster</i> , breeding ... ..	144
Conure, Hispaniolan, breeding ... ..	74
White-eared, breeding ... ..	113
<i>Cosmopsarus unicolor</i> ... ..	164
Finches, Gouldian, habitat conservation ... ..	92
Hornbill, Trumpeter, breeding ... ..	67
International Ornithological Congress, Notes from Christchurch, New Zealand ... ..	136
Kiwi, North Island Brown, breeding ... ..	59
<i>Leiothrix argentauris</i> , ... ..	118
<i>Lonchura</i> spp., field observations ... ..	77
<i>l. caniceps</i> , <i>l. castaneothorax</i> , <i>l. grandis</i> , <i>l. spectabilis</i> , <i>l. tristissima</i>	
Lorikeet, Josephine's, breeding ... ..	167
Red-flanked, breeding ... ..	3
Red-spotted, breeding ... ..	130
Lory, Duivenbodes, breeding ... ..	37
Mannikins, New Guinea field observations ... ..	77
Chestnut-breasted, Grand, Grey-headed, Hooded, Streak-headed	
Mesia, Silver-eared, breeding ... ..	118
Mitchell Park, Durban, S.A., Breeding 1990-91 ... ..	9
<i>Momotus momata</i> ... ..	38
Motmot, Blue-crowned, breeding ... ..	38
<i>Opidiphaps nobilis</i> ... ..	123
Padstow Tropical Bird Gardens ... ..	174
Parrot, Pretre's Amazon or Red-spectacled ... ..	185
Pigeon, White-naped Pheasant, breeding ... ..	123

<i>Pyrrhonorax pyrrhonorax</i> ... ..	51
<i>Pyrrhura leucotis</i> ... ..	113
<i>Ramphastos vitellinus</i> , breeding ... ..	179
Singapore, Jurong Birdpark ... ..	127
Softbills, British Imports - part 4 ... ..	88
Starling, Amethyst breeding ... ..	144
Ashy, breeding ... ..	164
<i>Touraco persa buffoni</i> , breeding ... ..	35
Toucan, Channel-billed, breeding ... ..	179
Touraco, Buffon's, breeding ... ..	35

\* \* \*

## CONTRIBUTORS TO VOLUME 97 - 1991

- BAPTISTA, Luis F.**  
 Field Observations of some New Guinea Mannikins ... .. 77
- COOKE, Dulcie**  
 Breeding the Red-flanked Lorikeet ... .. 3  
 Breeding the Red-spotted Lorikeet ... .. 130
- CUMMINGS, W. D.**  
 The 1990/91 Breeding Season at Mitchell Park, Durban, S.A... 9
- DOLTON, K. W.**  
 Breeding of Duivenbodes Lory ... .. 37
- ELLIS, Malcolm**  
 The Cornish Chough; Past, Present and Future (?) ... .. 51  
 Padstow Tropical Bird Gardens ... .. 174
- GIBSON, L.**  
 The Silver-eared Mesia ... .. 118
- HORNE, S. C.**  
 Breeding the Buffon's Touraco ... .. 35
- JACKSON, Sue, see KANTER, Michelle &**
- KANTER, Michelle & JACKSON, Sue**  
 Yinberrie Hills - Gouldian Finches and  
 the Mt. Todd Gold Project ... .. 92
- KRUSSMAN, Rosemary**  
 A Review of the 1990 Avian Breeding Successes  
 of a Mixed Species Rainforest Exhibit ... .. 25
- LARCOMBE, P. F.**  
 Breeding Blue-crowned Motmots at  
 Silverstone Wildlife Park ... .. 38
- LIEBERMAN, Alan**  
 North Island Brown Kiwi Breeding  
 Programme at San Diego Zoo ... .. 59

- LINDHOLM III, Joseph H.  
 Professor Carl Albert Naether ... .. 14
- LOW, Rosemary  
 Breeding the Hispaniolan Conure at Palmitos Park ... .. 74  
 The White-eared Conure ... .. 113  
 Breeding Josephine's Lorikeet at Palmitos Park ... .. 167  
 Pretre's Amazon Parrot ... .. 185
- McLEOD, Wayne, see WILKINSON, Roger &
- MERRY, Roger, see WILKINSON, Roger &
- OEHLER, David A.  
 Successful Propagation of the White-naped  
 Pheasant Pigeon at Cincinnati Zoo ... .. 123
- PERRON, Richard  
 Jurong Birdpark in Singapore ... .. 127
- PYPER, Stewart  
 Breeding the Amethyst Starling ... .. 144
- TROLLOPE, Jeffrey  
 British Softbill Imports - Part 4 ... .. 88
- WILKINSON, Dr. Roger  
 Notes from the International Ornithological  
 Congress, Christchurch, New Zealand ... .. 136  
 Chester Zoo Notes - 1990 ... .. 147
- WILKINSON, Roger & MERRY, Roger  
 Breeding the Trumpeter Hornbill at Chester Zoo ... .. 67
- WILKINSON, Roger & McLEOD, Wayne  
 Breeding the Ashy Starling at Chester Zoo ... .. 164  
 Breeding Channel-billed Toucans at Chester Zoo ... .. 179



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