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# AVICULTURAL MAGAZINE

SMITHSONIAN  
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VOLUME 108  
No. 1  
2002

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# AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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Vol. 108 - No. 1 All rights reserved ISSN 0005 2256

2002

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## MY EXPERIENCES BREEDING THE VICTORIA CROWNED PIGEON

by Rosemary Wiseman

Following the publication of the article by Nigel Simpson on breeding the Victoria Crowned Pigeon at Bristol Zoo Gardens (*Avicultural Magazine* Vol.107, No.2, pp.76-84 (2001) ) I feel it might be worth recording my own experiences with this species. This is simply because there were substantial differences between my birds and those at Bristol in both the breeding and rearing of the chick. Clearly any private aviculturist would have difficulty in providing the same facilities in terms of space and housing that birds can enjoy in a zoo. My birds happily used a wooden platform fixed about 2m (6ft 6in) above the ground in an aviary with a total height of about 2.7m (8ft 9in). This contrasts markedly with the approximately 6m (20ft) high nesting platforms at Bristol but proves nothing more, I believe, than that if birds are keen to breed they will adapt to the prevailing conditions. My second pair also use a nesting site at a similar height to the first pair but have unfortunately produced only infertile eggs.

Since most pigeons seem to prefer to lay undercover the nesting platform was initially placed inside one of the huts but the pair did not really like it and laid an egg which was immediately abandoned. The egg was incubated and the chick was hand-reared to five weeks but had a badly splayed leg which could not be corrected. The nesting platform was accordingly moved to the side of the flight and, to protect it from rain, rigid plastic sheets were placed on top of the roof above it. The birds had access only from one long side, as the short sides were built up with pieces of wood to prevent the egg from being kicked off the platform. Access to the nest was via a long rustic pole fixed at a right angle to the front. As with the Bristol birds, sticks were provided and a very half-hearted nest was constructed. I had placed a layer of very fine wood chippings on the top of the platform and slightly hollowed out the centre so that any egg laid would not roll about on the platform. This seemed to work well, with the birds arranging the sticks on top of the chippings.



I cannot provide the wealth of data that was collected at Bristol. This is because my pair spent most of the year on their platform either with an infertile egg (twice) or later with a fertile egg from which a chick hatched but died almost immediately. I knew the pair had yet another egg but did not think much about it and it was therefore with some amazement that I heard the unmistakable sound of a pigeon chick soliciting food. As the platform was above my head and I did not want to disturb whatever was going on, I left well alone. About 10 days later I saw the chick's head peering out from the parent bird's breast feathers. It was enormous and obviously not the hatchling I had imagined. It was probably about three weeks old. From that time the chick became increasingly visible. Although brooded constantly by the parents it would push through the breast feathers and stretch upwards to feed by thrusting its beak into the side of the parent's beak.

Unlike the Bristol pair my birds shared the brooding and feeding of the chick fairly equally. In fact if anything the male spent more time brooding the chick, and certainly spent more time with the chick once it had fledged. This may have been because the female was hand-reared and has no fear of human beings. She therefore tends to remain at the front of the aviary and attack anyone who attempts to enter. The male, captive bred but parent reared, is shyer and stays further back in the flight. He certainly seemed to sit from the early morning until about 4.00pm. She took the night shift but was always off the chick and waiting for me when I arrived to feed them in the morning. The birds were given mixed seeds - sunflower mix plus small dove condition seeds, pigeon pellets, extra peanuts (which they love), Witte Molen without iron, and a special pigeon softfood, as well as fruit and grated corned beef.

Once it had fledged at, I assume, the same age as the chick at Bristol, that is 30 days, I was concerned that at night it would become chilled - by this time it was the beginning of September. However from the first night onwards the chick returned to the nesting platform with the parents and all roosted there together. The adult birds proved excellent parents which is not always the case with pigeons. The Victoria Crowned Pigeons however are totally focused on the chick and if it is not right beside them, the male will immediately go looking for it.

The chicks of these big pigeons are completely enchanting. Not only do they share the adult plumage of blue and maroon but they also boast a disproportionately large crest which is an exact copy of that of the parents. The eyes of the chick also seem to be exceptionally large. I have seen the chick raise both wings up above its head and perform a little running dance, and have also seen the parents do this.

## THE BREEDING BEHAVIOUR OF A PAIR OF CINEREOUS VULTURES AT LINCOLN ZOO PARK

by Nicole Kehl and Megan R. Ross

Propagation of the Cinereous Vulture *Aegypius monachus*, also known as the European Black Vulture, has been a challenging task. In 1994, the captive population in North America consisted of an ageing potential founder stock of 21 individuals ranging from 21-36 years of age and an F1 generation of 25 individuals from one to 10 years of age (Diebold, 1994). Today there are a few F2 generation birds (Synder pers. comm.), but many of the offspring have been hand-reared, which may or may not affect the ability of individuals to breed successfully when adult. This paper documents the varying levels of success between 1995 and 2001 of two hand-reared Cinereous Vultures at Lincoln Zoo Park, Chicago, Illinois, USA.

According to the IUCN *Red List* (2000) the Cinereous Vulture is classified as near-threatened. Its current range extends from those European countries where it still survives and North Africa to the Middle East eastwards to Mongolia and China (del Hoyo et al. 1994). This species faces numerous threats to its survival, including habitat destruction, poisoning, illegal hunting, disturbance at nest sites and reduction of food supplies.

This species is not as social as other vultures. For the most part, it is observed singly or in pairs, but can be seen sometimes in small groups of up to six at a carcass. Cinereous Vultures form a monogamous pair bond between the ages of five and six years that is generally life-long. Nests are immense structures of sticks, twigs and grasses, and are re-used year after year with additional material being added each new breeding season (Cramp et al. 1980). This species prefers arboreal sites, but will sometimes use rock ledges or crags.

In the wild egg-laying can take place between February and April (del Hoyo et al. 1994). The clutch usually consists of one egg, but cases of two eggs have been documented. The breeding frequency varies from year to year and from pair to pair. Long before the egg is laid, the pair spend much time together in the nest (Hiraldo, 1983). Both male and female are said to be equally involved in incubation, brooding, feeding, guarding and tending the chick. The incubation period is 50-55 days. Fledging occurs at 100-120 days. The young remain with the adults during the day and will spend nights in the nest until six to eight weeks after fledging (Cramp et al. 1980).

Lincoln Zoo Park added Cinereous Vultures to its collection in October 1987. The current breeding pair has been together since May 1989. Both the male, born in April 1988, and the female, born in May 1987, are captive born and were hand-reared at other North American zoological gardens.

Our birds are housed in a large outdoor aviary (with a 267ft (approx. 81m) perimeter x 30ft (approx. 9m) high) . The Cinereous Vultures have been housed with other species such as Hooded Vultures *Necrosyrtes monachus*, Secretary Birds *Sagittarius serpentarius* and European White Storks *Ciconia ciconia*. The birds are fed twice daily on a varied menu consisting of a commercial meat diet, rats, shank bones and knuckle bones. Food was continually available to the pair and the amounts were increased during the breeding season.

At the onset of the breeding season the pair was observed spending an extensive amount of time together and performed several displays, such as head-stretch-and-turn display (Mendelssohn and Marder, 1989), bill touching, touching each other's heads with the tips of their bills, gently biting down on each other's cheeks (Cramp et al. 1980) and allopreening.

Nest building was initiated by the male which added sticks, grasses and straw to an area where keepers had created a wooden base or foundation of a nest for the pair. Initial nest building took place prior to any copulation being observed that season. Once copulation was observed, both birds engaged in active nest building (i.e. collecting sticks, grasses and straw and placing these in the nest). Aggression towards keepers also heightened during this time.



Nicole Kehl

Male Cinereous Vulture with nesting material



The breeding season is documented as beginning with the first copulation of the season. Over the past seven years, the first attempts at copulation were observed as follows: March in 1995, 1996 and 1997; February in 1999; January in 2000; and December in 2000. After the initial copulations were observed, the pair was seen copulating several times a day. This continued up to the day the egg was laid and for approximately three days after incubation began.

The incubating bird sat very low in the nest, completely hidden by outer branches of the nest, as opposed to sitting visibly higher when brooding. Aside from nest maintenance and egg turning, activity in the nest was for the most part minimal during incubation. The majority of the incubation and nest maintenance was performed by the male, especially as the hatch date got closer. When not incubating the egg, the male would leave the vicinity of the nest only to eat and/or collect nest materials.

Generally, the female would incubate during the morning, or most of the morning, with the male assuming this role in late morning to late afternoon. The male appeared to be compelled to switch with the incubating female and more than once was observed forcefully removing the female from the nest to take over incubation. This could have resulted in the unusual incubating and brooding behaviour in 2001, when the male did the majority of both while the female spent the majority of her time on the ground and played only a very small role in these parental behaviours.

In all years in which eggs were laid there was a significant increase in food consumption shortly after oviposition (egg laying) and, as mentioned previously, food was made available *ad libitum*. Two to 10 days before hatching regurgitation was evident in the exhibit. The adults also demonstrated an inclination to consume mice that were provided for other occupants of the exhibit.

No eggs were laid until 1994, at which time one egg was laid in a makeshift nest on the ground. That egg was abandoned shortly after being laid. No eggs were laid in 1995. Spring 1996 egg laying was similar to that observed in 1994. In 1997, one egg was laid in the cliff nest, which was removed after it did not hatch. It is unknown whether or not it was fertile. In 1998 an egg was laid and abandoned by the pair. Other birds in the exhibit consumed it before it could be rescued and a post mortem necropsy could be performed. In 1999 an egg was laid in the cliff nest and hatched after 55 days of incubation. The male chick was reared successfully by both parents. Our limited observations indicated that the male did the majority of caring of the chick. At the beginning of the next breeding season the juvenile male was removed from the exhibit when the adult male became extremely aggressive towards it.

After the success in 1999, we were extremely optimistic about our pair's ability to rear their chicks. Therefore, in 2000 we allowed them to incubate

the egg that was laid in the first week of March. Incubation lasted 56 days. The pair was successful in feeding and brooding the chick until it reached two and a half weeks of age when it died of unknown causes. Once again the male did the majority of nest maintenance, incubation, brooding and caring for the chick. Even when the female performed these activities the male was generally within close proximity to the nest.

For the 2001 breeding season, the pair of Cinereous Vultures began copulation attempts at the beginning of December 2000, which was even earlier than in the previous breeding season (i.e. January). One egg was laid the second week of February and was incubated for only one week before the pair abandoned the nest. The failure of this attempt was attributed to the premature timing of egg laying and dramatic changes in the weather. The female laid again the second week of April. The behaviour of the pair in 2001 was by far the most unusual. The male did almost all of the incubating. The female was rarely observed to attempt to switch with him. The egg hatched after 55 days of incubation. The male did all of the brooding and feeding of the chick. The female did not seem to participate in the care of the chick which, unfortunately, died due to an infection.

We have evaluated our successes and failures breeding Cinereous Vultures during the past seven years and have come to several conclusions. Our experience demonstrates that captive bred, hand-reared Cinereous Vultures can still possess the requisite skills to rear their own young. However, the last two years have shown that even birds that have successfully reared their young may need additional monitoring to ensure the survival of their offspring.

Evelyn Tewes (1996) expressed concern over the sensitivity of this species and issued a number of recommendations relating to captive breeding. Our breeding pair has been exposed to frequent keeper contact and nested successfully in an area exposed both to the elements and near the access through which keepers service the exhibit. In addition, sharing the exhibit with other species of birds has had no discernible impact upon successful breeding behaviour. This would suggest that with captive bred, hand-reared individuals the concerns expressed by Tewes (1996) may be less significant than anticipated. The fact that many of the current generations of F1 and F2 Cinereous Vultures were hand-reared may actually assist in the establishment of a self-sustaining captive population. As ensuing generations become better adapted to the conditions inherent to captivity, parent-reared offspring of the current captive-reared generations are more likely to be successful breeders (due to a life-long acclimation to captivity) and effective parents (due to their own history of having been parent-reared).

Also of concern to us is the unusual incubating, brooding and caring of the chick by the parent birds at Lincoln Zoo Park. In literature reviewed



about the Cinereous Vulture, as well as other vulture species, it is clearly noted that both parents are equally involved in these responsibilities (Cramp et al. 1980). Our birds have not shared these responsibilities equally, instead they have been performed mainly by the male. It is valuable to know that the male is fully capable of incubating the egg and caring for the chick when there may be difficulties with the female of the breeding pair. Such a success was documented in 1999 at Denver Zoo, Colorado, where the male Cinereous Vulture cared for the chick subsequent to the removal of the female due to her aggression towards the chick (Denver Zoo, 2000). We are continuing to attempt to gather information as to the level that these behaviours are shared by our two individual birds.

Systematic data collection detailing the time spent at the nest by each parent should yield valuable information about each parent's contribution to the incubation of the egg and the brooding of the chick by this species in captivity. The authors recommend that staff of other institutions that house Cinereous Vultures also collect such data in order to construct a statistical basis upon which captive management decisions for the propagation of this species can be developed.

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## THE GREY PARROT IN AVICULTURE

by Derian A. L. Silva Moraton

The Grey Parrot *Psittacus erithacus* is considered an exceptional mimic, capable of emulating up to nine other species of birds and one species of bat in the wild (Cruikshank et al. 1993) and of reproducing words with every accent and inflection pronounced so well that the teacher can be immediately identified; has an intelligence that has been compared with that of a gifted five year old child (Silva, 1991); and has an empathic nature that allows it to share its owner's deepest feelings (Brinker and Friedman, 1999). As aviary birds pairs reproduce fairly willingly compared to other species of equal size and if the breeder is sentient and meets their needs to feel safe and secure can establish a relationship that is rarely seen between aviculturist and breeding parrots (Brinker and Friedman, 1999; pers. obs.). Few parrots have such a following or are more misunderstood than this species. Many regard Grey Parrots as single person pets, yet if properly raised and socialized they willingly accept a broad range of people and scenarios, talking even in front of strangers (Brinker and Friedman, 1999; pers. obs.).

Socialization should occur when friends, neighbours or even children come to the house. Introduce them to the bird away from the cage, all the while rewarding good behaviour with words. This should start as soon as the bird is brought home and should continue throughout its life. A bird that has been properly habituated will feel comfortable in many scenarios, and will differ from one that has not been socialized, by not growling at people, objects or during minor incidences.

Another important aspect of caring for a Grey Parrot is companionship. Young birds which are suddenly left alone for long periods or even days while their owner or owners vacation, often develop anxiety, depression or commence to feather pick. Providing proper companionship takes the place of the parents in the wild, which provide companionship for many months after fledging, probably even until the commencement of the next breeding season. Your support initially will make a difference and over time will prove valuable in teaching proper behaviour. Some autonomy is obviously important but the bird must feel that you are a flock member, its dominant leader, and will always be there for it and will provide the necessary guidance. This does not mean that you cannot go to work, to dinner or even on outings, but that you should always devote time to the bird, even if this means several brief periods daily, to make it feel that it is never forgotten.

Grey Parrots have a reputation for denuding themselves. This is unjustified and generally the result of stress, neglect, fear, nervousness, inadequate diet and housing or is used as an attention getting vice (Johnson,

1987). Blanchard (1995) feels that in this species plucking is usually caused by an inadequate diet and lack of humidity and bathing. She also feels that youngsters may learn to pluck by being reared with aggressive preeners such as cockatoos. Wilson (1996) feels that allergies, toxins, endocrine imbalance (especially of the thyroid gland), disease and even failure to expose the bird to natural sunlight or full-spectrum lighting can be the cause.

In my experience many causes of feather plucking are due to the way youngsters are reared, which result in chicks with insecure personalities. They are given little training, are reared in groups and are simply not properly prepared for life. Chicks should be weaned before they are sold; should not have the wings clipped until they are capable of flying - premature wing clipping seems to cause neurosis (Tucker, 2000); and should be trained to obey commands such as to step up and down from the hand and to come and go. This training emulates that given by the parents, which encourages the young to fly, teaches them which foods are safe and edible, and how to evade predators - chicks are simply not fledged and abandoned, which is basically what happens when they are rushed through their weaning and sold. Training also teaches the youngster that you will provide it with guidance. In essence the youngster is trained to see you as the dominant flock member which will provide it with the security, psychological stimulus and training that it needs to thrive. Birds which have been reared within the proper parameters (see Tucker, 2000) tend to be less susceptible to plucking and are less prone to exhibit paranoical behaviour.

A feather plucker should be subjected to clinical tests, observed interacting with its owners or owners and family by a qualified behaviourist and its husbandry, including the environment it is housed in, should be examined in detail. This will help identify the problem as quickly as possible - a necessity given that the longer a bird plucks the less chance there is that it will recover.

Once a bird is seen plucking, it should immediately be taken to a veterinarian for a complete physical examination. This is likely to include tests for dermatitis or folliculitis, fungal, bacterial and viral culture or testing, microscopic work for ecto- and endoparasites, biopsies, radiographs and even feather pulp cultures. The process of elimination may not reveal immediate results but it is imperative that the medical aspect be ruled out.

The environment and interaction with the owner should also be examined by a qualified behaviourist. This may answer many questions, including the following. Is the bird kept in a permanently stressed situation? I once saw a bird kept in a large cage with countless toys and by a window overlooking a wooded lake - a seemingly ideal situation, until one day after many perplexing visits I saw a small falcon perched outside the window and staring at the bird, which reacted by immediately thrashing about its



cage. When the falcon left and it calmed down, it began to pull its feathers. Moving the cage to another room resolved the plucking. Are lights at night from passing vehicles precluding adequate rest? Can nicotine from the hands of smokers be the causative factor? Is the bird shook, smacked or screamed at when it plucks? Does the owner encourage plucking by rushing immediately to the cage and petting the bird, gently talking to it or feeding it special treats? Is the owner afraid of the bird and wears gloves when changing the food and water? Many scenarios can come into play and a behaviourist may be able to quickly and efficiently identify these.

The diet also needs to be examined. A principally seed diet is terribly deficient, lacking vitamins A, D and E and calcium (Clubb, 1997). Seeds also lack the necessary amino acids and may be so oily that the bird is basically being fattened but not given adequate nutrition. Pellets offer a more suitable alternative (see Ullrey et al. 1991) and can be supplemented with 10% leafy green or yellow vegetables and 5% fruit (Burgmann, 1996; Bauck, 2000) to prevent monotony.

Bathing is also important and if the bird is introduced to water at a young age, it will enjoy being misted or sprayed with tepid water. I do not believe that insufficient bathing alone can cause plucking, but it may be one of a series of factors that induce plucking; if the owner does not bathe his or her bird, then the bird is likely being neglected and probably does not have the necessary toys or receives the balanced, nutritious diet that it requires.

If the above do not provide relief, discuss medical alternatives with your veterinarian. These include the use of an Elizabethan collar and anti-depressant drugs. These are unlikely to cure the problem but they may offer temporary relief while other alternatives (e.g. herbal medicine, acupuncture, etc.) are considered.

Grey Parrots can suffer from a series of husbandry related problems. Most common is a calcium deficiency. Their calcium requirements appear to differ from those of other parrots and are probably the least understood aspect of their husbandry (Clark, 2001). Calcium deficiency can cause seizures, fractures and even egg-binding. I find that birds fed fatty seeds often exhibit calcium absorption problems and Wissman (1999) concurs. The diet given to Grey Parrots can be supplemented with calcium gluconate syrup, which is less irritating to the gastro-intestinal tract and more easily absorbed than in other forms (Silva, 1991). Many pellets contain adequate calcium/phosphorus ratios so it is wise to discuss with your avian veterinarian whether calcium gluconate syrup is still required if pellets are fed. If it is used, it can be given to the bird on boiled brown rice, wholegrain bread or in mashed sweet potato. It can also be provided in the water, but some birds do not drink very much water if they receive quantities of fruits and vegetables; birds fed principally pelleted diets will drink more water. Discuss

with your avian veterinarian the best way of administering the calcium gluconate syrup to your bird.

Also to prevent hypocalcemia, the bird should be exposed to natural sunlight or full-spectrum lighting, which is necessary for vitamin D<sub>3</sub> production - without this vitamin and phosphorus, calcium cannot be absorbed. It has been suggested that the dark plumage of these parrots means that they are inefficient at absorbing this vitamin from a dietary source (Clark, 2000), which is how this vitamin is often supplemented in captivity, and they must synthesize it in the feathers. Full-spectrum light bulbs have a short life span in which production of all the rays diminish markedly. Most manufacturers recommend that the bulbs be replaced every six to 12 months. Consult the manufacturer for advice. If exposing the bird to natural sunlight, cover part of the cage to prevent hyperpyrexia (heat stroke).

Grey Parrots are also vulnerable to vitamin A deficiency, which often causes yeast infection evinced by white plaque on the choanal slit and oropharynx, blunted or eroded choanal papillae, respiratory disorders and even skin infections (Wissman, 2001). This deficiency can be prevented by feeding green, leafy vegetables, part-boiled carrots, chilli peppers and even mangoes (Clark, 2001). Green, leafy vegetables have to be selected with care, as many are rich in oxalic acid that may inhibit calcium absorption. Spinach is the worst offender. Consult your veterinarian for information about which greens are low in oxalic acid and can be fed to your bird. If you feed it spinach, do so sparingly - never daily (Wissman, 1999). Safe alternatives that are rich sources of vitamin A include carrots, sweet potato and hot peppers, which have 28,129, 6,636 and 10,750 IU of vitamin A per 100g, respectively.

Grey Parrots appear to be susceptible to two viruses in particular - psittacine beak and feather disease and polyomavirus. The former causes progressive feather loss or even the appearance of red feathers on the body (Shoemaker, 1999). It is highly contagious and easily spread. Suspected birds should be subjected to microscopic evaluation of affected feathers, which will show the characteristic signs of this virus, and/or the virus-specific DNA probe, a test which is highly effective. Consult your veterinarian about a vaccination programme or test if you feel your bird has been exposed.

Abdominal distension, poor feathering, delayed crop emptying and profuse bleeding under the skin are classic symptoms of polyomavirus. Birds can be infected carriers. As with the aforementioned virus condition, a test and vaccine are available but vaccination is a very contentious issue, with different parties taking different stands on its efficacy and value. Again consult a knowledgeable veterinarian about the need for testing and vaccination.

Teaching a parrot to talk is not just repeating the same word over and

over again or playing a cassette recording. It requires interaction, stimulation and attention over a prolonged period, especially if your goal is to maximize the bird's talking ability; most owners, however, become satisfied after a few dozen words and give up, failing to exploit the bird's potential. If a few words satisfy you, then fine; if not, continue teaching words throughout the life of the bird and both will be handsomely rewarded - the bird by feeling that it receives the necessary attention and you in having a virtuoso.

Initially select words with strong consonants or which are pronounced with enthusiasm. One good way to teach not only words but dialogue is to ask a question in a monotone voice and then to respond with considerable enthusiasm, e.g. : Q. "Can you talk?" A. "I can talk. Can you fly?" By emphasizing the response, you can teach the bird easily and quickly. As an example, I once taught a pet African Grey the responses to "I love you" ("I love you too") and "would you like some breakfast?" ("please give me orange juice and wheat toast") in a period of less than a week.

As new words and phrases are learned, the old ones may be repeated less often but they are certainly not forgotten. Only if the bird is suffering emotionally will the speech decrease or cease altogether. I know of more than one case in which Grey Parrots stopped talking following a divorce or the arrival of a child, which resulted in them getting less attention, or a new pet being acquired, resulting in them having to share the attention.

Grey Parrots originate from Equatorial western and central Africa (Juniper and Parr, 1998). Within this area, three subspecies have been described:

*P. e. erithacus*, the so-called African Grey, has a range that extends from Côte d'Ivoire to western Kenya, north-western Tanzania, southern Democratic Republic of Congo and northern Angola.

*P. e. princeps*, the so-called Príncipe Island Grey, from the islands of Príncipe and Bioko in the Gulf of Guinea. This subspecies, reportedly larger and darker than *P. e. erithacus*, has generally been considered questionable and is not regarded as valid (see Forshaw, 1989; Juniper and Parr, 1998).

*P. e. timneh*, the so-called Timneh or Maroon-tailed African Grey, has a range that extends from western Guinea-Bissau and Sierra Leone to southern Mali and the area of the Bandana River in Côte d'Ivoire.

If *P. e. princeps* is considered invalid as it should be - specimens are no different from large, dark birds from Cameroon - then differentiating between the remaining two is fairly easy. The main diagnostic features are:

|                | <i>P. e. erithacus</i> | <i>P. e. timneh</i>         |
|----------------|------------------------|-----------------------------|
| Plumage colour | light to medium grey   | dark grey                   |
| Tail colour    | red                    | maroon                      |
| Bill colour    | black                  | upper mandible reddish horn |
| Body weight    | 350g-600g              | 310g-320g                   |



Within its broad distribution *P. e. erithacus* exhibits great variability in size and plumage, making it possible to have birds weighing from 350g-600g. Wissman (1999a) notes that birds from Ghana are small and dark while those to the south and east of that country are large; those to the east also exhibit somewhat paler grey plumage; and further south the plumage darkens again.

The differences have resulted in a series of names having been coined and used as selling points. I have seen Congo Grey, Cameroon Grey, Zaïre Silver Grey, Ghana Grey and just about every other country in its range attached to the name; when one name becomes recognised another seems to arise with a concurrently higher price tag. I recently heard of Príncipe Grey Parrots being offered which upon examination were found to be the typical small variety from Ghana. It is deceptive to use such eponyms to increase the value of a bird or to imply the ability to talk.

Sexual dimorphism is lacking in *P. e. timneh* but present in *P. e. erithacus* provided that the birds being examined are from the same locality; if birds from different parts of the range are intermixed, then sexing becomes questionable. If birds from the same area are examined, males will be found to be darker overall and to possess a greater deposit of melanin on the wings (Silva, 1991). However, the most reliable methods are DNA sexing and surgical sexing. DNA sexing is now widely popular. It is non-invasive and can be done using a few feathers; blood feathers are no longer required for this procedure. The other method involves a quick, simple and relatively safe surgical procedure (Taylor, 1990) performed under anaesthesia. A small incision is made on the left side (parrots have a single functional ovary, located on the left side of the body), into which the laparoscope is introduced. This allows the veterinarian to view the gonads and surrounding organs and determine not only the reproductive state of the bird but also assess its general health. Laparoscopy is recommended because up to 15% of the birds examined exhibit gross abnormalities that could affect their breeding ability (Murphy, 2001). Such birds would never be detected using DNA sexing.

Immature Grey Parrots are very distinctive, both in their appearance and behaviour. African Greys have the tail feathers edged with dark grey and have a dark grey iris, making the eyes look almost black when compared to the straw and black eyes of the adults. Brinker and Friedman (1999) note that the iris begins to change gradually at five to six months of age and it takes two to three years for the straw yellow iris to be acquired. I find that the change from almost dark eyes to ones that are greyish and black occurs by about six months of age and that the iris then changes slowly to a yellowish-white before becoming straw coloured. Young *P. e. timneh* are easily distinguished by their dark mandibles; were it not for their darker plumage, even at this stage, they could pass to the unsuspecting as *P. e.*

*erithacus*. The bill commences to change colour at about 10 weeks of age (Brinker and Friedman, 1999) and is adult colour by eight to 12 months of age. The iris is similarly dark grey. Low (1992) pointed out that the iris commences to change to a pale grey by six months of age and is pale yellow by one year of age.

Young Grey Parrots tend to spend time trying to dig through the bottom of their cage. This behaviour ceases as they become more confident in their enclosure and discover toys and other objects provided to enrich their habitat. Most go through a difficult stage at about 12 months of age, when they become more independent and sometimes prove even slightly aggressive, nipping when least expected. Training, as pointed out earlier, is important to correct this (Blanchard, 2001).

Of the larger parrots, Grey Parrots are amongst the easiest to breed. Most randomly selected pairs will nest once acclimatized but the chances of success increase if the birds are allowed to pair naturally. I recommend placing together a group consisting of an equal number of males and females and marking these (e.g. with coloured markers applied to the naked face, clipping part or the entire tail, or applying dye to the breast) to allow pairs that nexus to be easily recognised and separated. If either males or females are in short supply, a pairing cage can be constructed with three compartments on one side and one long compartment on the opposite side; the scarcer sex is placed in the single compartment and is offered a choice of three perches that run into the individual cages where the prominent sex is housed, allowing two birds to sit next to each other. Examining the location of droppings on the floor should be enough to tell which two birds have taken a fancy to each other. Once a pair has been selected, then husbandry must be addressed, i.e. cage, nest and diet. The ideal diet should be pellets, supplemented with greens and fruits.

In the experience of most breeders, Grey Parrots breed best when housed in small cages, which seem to heighten their sense of security. Pairs will willingly nest in enclosures as small as 1.2m (4ft) long but a more suitable minimum is 1.8m (6ft) long. Suspended cages are best, as they allow droppings and discarded food which can spoil to pass out of reach. A cage width and height of 1.2m (4ft) is recommended. Walk-in enclosures usually have a height of 1.8m (6ft) but entering the enclosure for cleaning increases the level of nervousness in shy birds and in my experience acts as a breeding deterrent. Vines grown around the back and sides to offer some security are sometimes tolerated. The nest-box should measure 25cm-30cm x 25cm-30cm x 60cm (approx. 10in-1ft x 10in-1ft x 2ft deep). It should have a ladder giving access to the bottom, a side inspection door (removable tops frighten birds, which may thrash about and break eggs or kill chicks) and have slats nailed to the inside to allow the female to chew slivers of wood

and in doing so augment the nesting material; many females will discard most substrate but allowing them to chew slivers seems to act as a stimulus.

African Greys exhibit no set nesting season in captivity. They will generally reproduce when conditions are to their liking. I find that Timneh Greys tend to be less prolific and more set in their breeding, but this may merely have been the case with the pairs which I have kept. If eggs are removed to encourage pairs to lay again, the next clutch can be expected about the time the eggs should hatch, or about four to a maximum of six weeks later. If young are taken when very young, a period of six to eight weeks may elapse before a replacement clutch is laid. The longer the chicks remain with their parents the greater the time between clutches. If allowed to fledge their young, pairs may nest only once or twice a year.

Breeding usually occurs when displaying is seen. The male will lower the wings to reveal the pale coloured rump, or will pump the wings to reveal and obscure the rump. The feathers will be flared to make the body appear larger and the pupils will be contracted. Courtship feeding follows. Mating takes place from the side, with the male retaining one foot on the perch. During copulation a series of grunts will be heard, which even if you have never heard them before, on first hearing them you will know exactly what is happening.

Grey Parrots produce clutches of three to four eggs. Low (1992) gave the incubation period as 28-30 days. In my experience it is closer to 28 days with *P. e. erithacus* and is often the same for the Timneh Grey or sometimes only 26 days. Newly hatched chicks possess dense whitish down. The nails and bill are brownish in the Timneh Grey and black in the nominate form. The secondary down is grey, short and dense. The young fledge around 79 days ( an average from 21 chicks of both subspecies) but they are so shy that many breeders do not notice they have fledged until much more time has passed. Weaning occurs by 12 weeks, though some fledge sooner and others are slower at learning to feed themselves. I am opposed to rushing chicks into feeding themselves and feel that they should be allowed to do so on their own accord. Young being hand-reared commonly charge the hand or make puppy-like grunts. Sexual maturity is reached on average at four years of age, though I have had *P. e. erithacus* lay when 30 months of age and a Timneh Grey produce fertile eggs when 26 months of age.

Over the years, I have reared many, many Grey Parrots from multiple pairs. This experience has shown me that keeping more than one pair seems to stimulate breeding. Single pairs will readily nest but prolificacy is maximized if there are a number of pairs housed within earshot of each other. Breeders thinking they will make a fortune rearing young are urged to refrain from purchasing an excessive number of pairs, given that there is a saturation level in which production will be suboptimal. Whether this is



due to perceived crowding or some other biological factor I cannot say. My recommendation is that if you intend to raise this species commercially refrain from having more than eight pairs in a given area; more pairs can be kept elsewhere if they are outside the hearing range. Keep pairs preferably in a quiet area; large macaws and cockatoos, with their loud calling, can create a nervousness that can affect reproduction.

When properly cared for, Grey Parrots can make outstanding pets and ideal aviary birds, and can be long-lived. Brouwer et al. (2000) cite one bird which lived 49 years and eight months, its age being verifiable. Most antediluvian parrots are a figment of the imagination, with disease, poor diet and bad husbandry not uncommonly causing premature death.

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## BIRDWATCHING IN PAPUA NEW GUINEA AND NEW BRITAIN

by Roger Wilkinson

New Guinea and birds of paradise have held a fascination for me for many years and this is a country that I had always wanted to visit. An additional draw was that Papua New Guinea is home to Palm Cockatoos *Probosciger aterrimus* and New Britain to Blue-eyed Cockatoos *Cacatua ophthalmica*; two parrots with which I have been closely involved for many years and for which I keep the European zoo studbooks. The opportunity to



Roger Wilkinson

Superb Fruit Dove

see these and many of the other birds we work with at Chester Zoo came in July and August 2001 when I joined some friends on a four-week birdwatching trip to Papua New Guinea which included five days on the island of New Britain.

The trip was arranged for our small party and led by Ian Burrows, of Sicklebill Safaris, who previously worked at the University in Port Moresby and is familiar with both the country and its birds. Port Moresby, the capital of Papua New Guinea, was the base for our visit and the main means of transport to outlying areas was by small plane. Closer to Port Moresby we travelled by road and our first stop was Varirata National Park. Blue-winged Kookaburras *Dacelo leachii*, Fawn-breasted Bowerbirds *Chlamydera cerviniventris* and Dumonti's Mynas *Mino dumontii* greeted us on arrival at the rather downbeat Kokoda Trail Motel which is located a short distance outside the park. I was particularly pleased to see the Blue-winged Kookaburras as we achieved our first successful breeding of this magnificent bird at Chester Zoo in 2001.

Over the next three days we found an amazing variety of birds. Amongst the more unusual were huge Papuan Frogmouths *Podargus papuensis* (which were found at night by spotlighting), Barking Owls *Ninox connivens* and Hooded Pitohuis *Pitohui dichrous*. Kingfishers included Rufous-bellied Kookaburra *D. gaudichaud*, Azure Kingfisher *Alcedo azurea*, Little Kingfisher *A. pusilla* and the beautiful Brown-headed Paradise Kingfisher *Tanysiptera danae*. The first bird of paradise I saw was a female-plumaged Raggiana Bird of Paradise *Paradisaea raggiana* seen briefly along one of the forest trails. Many others were seen later noisily mobbing a Barking Owl, and watching several full-plumed male Raggiana Bird of Paradise displaying at a lek was a truly special experience.

Forest birding is hard work and many more birds were heard than seen. These included noisy growling Eastern Riflebirds *Ptilorus (magnificus) intercedens* and plaintive calling Chestnut-backed Jewel Babblers *Ptilorhoa castanonotus*. Forest mammals were even more elusive and only one forest wallaby (the Grey Dorcopsis *Dorcopsis luctuosa*) was seen bounding across a trail. Open country birding is much easier and returning to Port Moresby we had the pleasure of watching Green Pygmy Geese *Nettapus pulchellus*, Pied Herons *Egretta picata*, Comb-crested Jaçanas *Irediparra gallinacea* and many other waterbirds on lakes close to the Pacific Adventist University. Nearby we found two roosting Papuan Frogmouths and were shown the bower of a Fawn-breasted Bowerbird. The latter was a surprisingly large structure freshly decorated with fresh green berries. Birding the following day in mangrove habitat at Hisiu produced skulking mangrove specialists including Mangrove Robin *Eopsaltria pulverulenta*, Mangrove Fantail *Rhipidura phasiana* and Mangrove Gerygone *Gerygone levigaster*. Papuan



Harriers *Circus spilonotus* and Lesser Frigatebirds *Fregata ariel* were much easier to see.

We then flew over extensive lowland forest to land on a Second World War jungle landing strip at Kikori, a small town in the middle of nowhere on the border with Irian Jaya. Our quarters for the next four days were at the Chevron oil base further north called Kopi Camp. This was real lowland rainforest away from human hunting pressures. Palm Cockatoos, Pesquet's Parrots *Psittirichas fulgidus*, Eclectus Parrots *Eclectus roratus* and numerous fruit doves, including Ornate Fruit Doves *Ptilinopus ornatus* and Orange-bellied Fruit Doves *P. iozonus* were all seen here. Thirty-nine Blyth's Hornbills *Rhyticeros plicatus* and more than 50 Torresian Imperial Pigeons *Ducula spilorrhoa* were counted flying out of a single fruiting tree. Greater Flying Foxes *Pteropus neohibernicus* were also numerous and conspicuous. Notable birds here included the little known Yellow-eyed Starling *Aplonis mystacea*. Hooded Pittas *Pitta sordida* were heard and I glimpsed a Blue Jewel Babbler *Ptilorhoa caeruleascens*. Although getting only brief views of this ground living bird's wagging blue tail these were perhaps the best views had by any of the party of this very elusive bird. Crinkle-collared Manucodes *Manucodia chalybata* and Glossy-mantled Manucodes *M. atra* were seen and King Birds of Paradise *Cicinnurus regius* were also found but no adult males were seen at Kikori.

Before leaving Kikori to fly back to Port Moresby we greatly enjoyed being shown a Spotted Cuscus *Phalanger maculatus* kept as a pet by one of the townsmen. We then were scheduled to fly to Kiunga, a forest township on the Fly River via the mining town of Tabubil. Tabubil is the wettest place in New Guinea and situated in the middle of continuous jungle amongst hills adjacent to a vertical cliff-face. Bad weather delayed our departure and low cloud and rain prevented the pilot finding the landing strip at Tabubil so we diverted and instead flew direct to Kiunga.

The forests near Kiunga were home to more Palm Cockatoos and Pesquet's Parrots. We followed a trail leading to a Greater Bird of Paradise *Paradisea apoda* lek site. Here were not only several displaying male Greater Birds of Paradise but also a male Raggiana and several birds that appeared to be hybrids between these two species. The visiting females all appeared to be Greater Birds of Paradise and after his display one magnificently plumed male Greater was twice observed copulating with two of these females. Copulation was a relatively brief affair with the male extending his wings down on each side of the female and retaining balance by flapping these whilst mating her.

Other birds seen at Kiunga included Trumpet Manucode *M. keraudrenii* (a male heard calling was observed displaying lifting the 'horns' on the sides of his head), Black-capped Lories *Lorius lory* and Red-flanked

Lorikeets *Charmosyna placentis*. The next day we took a three-hour boat trip up the Fly then Elevala Rivers to the locally owned Ekame Lodge. This is situated in undisturbed lowland forest and offered opportunities to track some of the most difficult forest birds. We saw tracks in the mud and dung on the trail indicating the presence of Southern Cassowary *Casuarius casuarius* and heard them calling several times. I was fortunate to see one of these magnificent birds, perhaps curious to get a distant look at the human



Roger Wilkinson

**Nicobar Pigeon**

forest visitors, before it shot back deep into the forest. Thanks to the skill of the local guide we also had excellent views of Southern Crowned Pigeons *Goura scheepmakeri*, Little (Lesser) Paradise Kingfishers *T. hydrocharis*, a displaying male Twelve-wired Bird of Paradise *Seleucidis melanoleuca* and a male King Bird of Paradise. Other birds here included Hook-billed Kingfisher *Melodora macrorrhina* and Black-sided Robin *Poecilodryas hypoleuca*. An unexpected bonus was a Hooded Pitta that in response to taped calls flew in to perch only a few metres (yards) away.

We returned by boat to Kiunga then drove to Tabubil stopping en route to watch a dark Peregrine Falcon *Falco peregrinus* and several Little Ringed Plovers *Charadrius dubius*, each of the distinctive local forms, as well as a singing male Golden-backed Whistler *Pachycephala aurea*. The following day near Tabubil, in a rare break in the rain, we had an amazing morning with up to 10 Carola's Parotias *Parotia caroli*, including several full colour males with reflective breast shields. Magnificent Birds of Paradise



*Cicinnurus magnificus* and sub-adult Superb Birds of Paradise *Lophorina superba* were also seen. We also enjoyed excellent views of Obscure Berrypecker *Melanocharis arfakiana*, Dusky Lories *Pseudeos fuscata*, Orange-breasted Fig Parrots *Cyclopsitta gulielmiterti* and many species of fruit doves including a male Superb Fruit Dove *P. superbus*. In another area nearby after hearing many calling we finally saw a male Magnificent Riflebird *P. magnificus*.



*Roger Wilkinson*

**Blue-winged Kookaburra**



Heavy rain at Tabubil prevented our flight to Mount Hagen landing there and instead it diverted to Kiunga, waiting for us to fly there on a smaller plane. At Kiunga we transferred immediately to the Mount Hagen plane and arrived there late afternoon but in time to break our journey to Kumul Lodge to search for and find a beautiful male Superb Bird of Paradise. Kumul Lodge was a one-night stopover but in less than a couple of hours birding around the grounds at dusk then dawn we had close encounters with a splendid male Brown Sicklebill *Epimachus meyeri* and a male Ribbon-tailed *Astrapia Astrapia mayeri*. Other birds here included Crested Bird of Paradise *Cnemophilus macgregorii*, Mountain Firetails *Oreostruthus fuliginosus* and Mountain Mouse Warblers *Crateroscelis robustus*.

We next flew to Tari from where we were driven up to Ambua Lodge. Birding around Ambua Lodge was exceptionally good for parrots with a flock of over 50 Musschenbroek's Lorikeets *Neopsittacus musschenbroekii*, as well as Papuan Lorikeets *C. papou* (both red phase and black phase birds), Whiskered Lorikeets *Oreopsittacus arfak* and Brehm's Tiger Parrots *Psittacella brehmii*. Other birds seen here included Blue-capped Ifritas *Ifrita kowaldi* and Archbold's Bowerbirds *Archboldia papuensis*. Birds of paradise really were the star birds and included Princess Stephanie's *Astrapias A. stephania*, Ribbon-tailed *Astrapias*, Brown Sicklebills, Short-tailed *Paradigalla Paradigalla brevicauda*, Lawe's Parotias *P. lawesii*, Lorias Bird of Paradise *Cnemophilus loriae* and King of Saxony Birds of Paradise *Pteridophora alberti*.

Driving beyond Tari Gap our vehicle became bogged down when attempting to reverse on a narrow road and we were forced to begin the 20km (approx. 12½ miles) walk back to the lodge leaving our driver with his bus. Thankfully after two hours hard walking, and getting closer to dark, we were pleased to be caught up by the bus that had been towed out by another vehicle. The next morning saw us watching a male Blue Bird of Paradise *P. rudolphi* in the company of exotically ornamented wigmen at Daula Village. Tit Berrypeckers *Oreocharis arfaki*, Crested Berrypeckers *Paramythia montium*, Wattled Ploughbills *Eulacestoma nigropectus* and several more birds of paradise were found, and on the journey back to Tari we were at last successful in finding a Salvadori's Teal *Anas waigiuiensis*. Also in the vicinity of Ambua we enjoyed watching a shy Mountain Cuscus *P. carmelitae* before it disappeared into thicker foliage and were shown a very large Boelen's Python *Morelia boeleni* that had been captured by local villagers.

The flight from Tari to Port Moresby was uneventful. From Port Moresby we explored the Leā Leā mudflats, this time extricating our bogged down vehicle from the mud, before checking off a number of wading birds including Terek Sandpiper *Tringa terek*, Greater Sand Plovers *C. leschenaultii*, Lesser

Sand Plovers *C. mongolus* and Red-necked Stints *Calidris ruficollis*. We also saw a number of less expected birds including Orange-footed Scrubfowl *Megapodius reinwardt*. During the three weeks on mainland Papua New Guinea I saw a total of nearly 300 species of birds including 16 species of parrots, 25 of pigeons, 13 of kingfishers and 20 different species of birds of paradise.

New Britain, the largest of several islands in the Bismarck Archipelago, is situated off the north-eastern coast of Papua New Guinea. No birds of paradise occur on New Britain but it is home to a number of birds found nowhere else. We flew from Port Moresby via Nadzab to West New Britain landing near the small town of Hoskins. From there we drove to Walindi Plantation Resort which was our base for our five-day stay on New Britain. From here we visited a number of forest sites where birds included Knob-billed Fruit Doves *P. insolitus*, Red-knobbed Imperial Pigeons *D. rubrica*, Black Imperial Pigeons *D. melanochroa*, New Britain Kingfishers *Halcyon albonotata* and Black-headed Paradise Kingfisher *T. nigriceps*.

Blue-eyed Cockatoos were not uncommon and Eclectus Parrots abundant. Other parrots seen included Purple-bellied Lorries *L. hypoinochrous*, Red-flanked Lorikeets and three delightful Bismarck Hanging Parrots *Loriculus tener*. Pokili Wildlife Management Area included an area of hot sulphurous springs close to which Melanesian Megapodes *M. eremita* tunnelled into the earth to lay their eggs and leave them to be incubated by the geothermal heat.

A power-boat trip from Walindi Plantation Resort took us past flocks of Lesser Frigate Birds and out to a number of islands surrounded by coral reefs. Here we eventually found Nicobar Pigeons *Caloenas nicobarica*, seen first only in flight leaving the forests of Kimbe Island and then found perched high in trees when we landed on Restorf Island. At Chester Zoo our Nicobars used to spend a lot of time on the floor of their aviary and I had wrongly expected to see these on the ground. We also enjoyed watching Beach Kingfishers *H. saurophaga* and numerous brightly coloured fish in the shallow water close to the beach.

A long stop over in Port Moresby on the way home gave time for a visit to the University Botanical Gardens. Here I was delighted by a very inquisitive tame and talking Raggiana Bird of Paradise which clearly enunciated "Hello", "Goodbye" and "ha ha ha ha" as well as some words in its *niugini* pidgin vocabulary, and five Blue-eyed Cockatoos one of which repeatedly called "Cocky Kaikai". "Kaikai" is pidgin for food! Blue-eyed Cockatoos and their current status on New Britain was the subject of a separate short article in the previous issue (*Avicultural Magazine* 107,4:146-148).

## BIRD NOTES FROM CHESTER ZOO, 2001

by Roger Wilkinson

New arrivals at Chester Zoo in 2001 included a pair of Red-billed Curassows *Crax blumenbachii* on loan from the Cracid Foundation, Belgium, where they were bred. This critically endangered curassow originates from the Atlantic rainforests of Brazil where a captive breeding and reintroduction programme is currently being conducted. This is especially pleasing for me in that I was fortunate enough to visit the Atlantic rainforest and see these birds at the Linhares Reserve when birding in Brazil in 1992. The timing of the arrival of the Red-billed Curassows is fortuitous in that 2002 heralds the European Association of Zoos and Aquaria (EAZA) Atlantic rainforest conservation campaign.

We received a pair of Argus Pheasants *Argusianus argus* on loan from Michel Klat's fine collection at Hare Hatch and a pair of Malaysian Peacock Pheasants *Polyplectron malacense* on deposit from the World Pheasant Association. The latter holds breeding groups of Mountain Peacock Pheasants *P. inopinatum* and Malaysian Peacock Pheasants in the UK in trust for the Malaysian Department of Wildlife and National Parks. Chester Zoo has strong links with the WPA and has held a pair of Mountain Peacock Pheasants as part of this programme since 1995. We first bred from this pair in 1997 and with the two chicks reared in 2001 have to date successfully reared nine chicks. Earlier this year the WPA was asked if it could send some new bloodlines to complement the Malaysian Wildlife Department's own stock to save taking further birds from the wild. As a result in September 2001, a pair of Mountain Peacock Pheasants (including a male bred at Chester Zoo) and a pair of Malaysian Peacock Pheasants were shipped by the WPA to Kuala Lumpur. From Kuala Lumpur they were transferred to the Malaysian Wildlife Department's pheasant breeding station at Sungkai.

The pair of Malaysian Peacock Pheasants will now be the focus of our attention with respect to breeding as in line with genetic management we have been advised that the our pair of Mountain Peacock Pheasants have now produced sufficient progeny for the programme's current needs.

The Satyr Tragopans *Tragopan satyra* parent-reared two chicks which have now proven to be two males. Six Green Peafowl *Pavo muticus* and three Common Peafowl *Pavo cristatus* were also reared. The two young male Congo Peafowl *Afropavo congensis* bred in 2000 were left in the aviary with their parents throughout 2001. In June the female hatched a chick that survived 10 weeks and two chicks from a second clutch hatched in November but unfortunately neither of these were reared to independence. Our second pair of Congo Peafowl, which includes a female bred at Chester in 1995,





Roger Wilkinson

### Vietnamese Pheasant

again laid eggs but these proved to be infertile. We had our first breeding success with Vietnamese Pheasants *Lophura hatinhensis* with one chick hatched being foster reared after artificial incubation. Lady Amherst's Pheasants *Chrysolophus amherstiae* were hatched but none were reared and five Crested Wood Partridge *Rollulus roulroul* were bred.

The West African Black-crowned Cranes *Balearica pavonina pavonina* hatched two chicks and we decided to leave these with their parents. The chicks were reared until when just over three weeks old both apparently healthy chicks were found dead. Post mortem examination suggested the cause of death to have been pneumonia, which may have been the result of infection by the parasite *Syngamus trachea* that had occurred despite the initiation of a regime of routine prophylactic worming for these chicks.

Because Emmen Zoo required a large number of penguins for its new exhibit we were able to produce a considerable batch of young Humboldt Penguins *Spheniscus humboldti*. A total of 30 penguins were hatched either in the incubator or under their parents. Of 21 that were incubator hatched all but three were successfully hand-reared. Parent-rearing was more successful than in previous years with six of the nine penguins hatched under their parents being reared to independence. It was very rewarding to be able to watch the youngsters with their parents and observe the adult penguins

encouraging their fledged chicks to join them in the pool.

In our large aviary for European Birds - Europe on the Edge - the Waldrapp Ibis *Geronticus eremita* reared three youngsters and the White Storks *Ciconia ciconia*, in a nest easily observable to our visitors offered them much interest caring for their two chicks. The Eurasian Spoonbills *Platalea leucorodia* nested and their first clutch was removed for artificial incubation and hand-rearing. Two chicks grew well and were reared to 30 days when skeletal growth problems became apparent which resulted in the loss of these chicks. Post mortem results revealed a calcium deficiency. The second clutch was left under the parent spoonbills and three chicks hatched but one died after two days and a second at 13 days old. The third was reared by the parents with the assistance of supplementary feeds given by the keepers. This chick fledged prematurely at just over a month old and failed to survive.

White-headed Ducks *Oxyura leucocephala* nested in Europe on the Edge and three of their ducklings were artificially reared. Red-crested Pochards *Netta rufina*, also bred in Europe on the Edge and produced two parent-reared broods, one of four ducklings and the other of a singleton. Other waterfowl reared in the collection included two Black-necked Swans *Cygnus melanocoryphus*, eight Mandarin Ducks *Aix galericulata*, four Falcated Ducks *Anas falcata*, five Laysan Teal *A. laysanensis*, two Garganey *A. querquedula* and 11 Common Shovelers *A. clypeata*. Twelve Marbled Teal *Marmaronetta angustirostris* were hatched of which seven were successfully reared. Baer's Pochards *Aythya baeri* and Ferruginous Ducks *A. nyroca* were both hatched in 2001 but despite several surviving to over three weeks old none were reared to independence. More rewarding was the rearing of three Smew *Mergus albellus* and a Hooded Merganser *M. cucullatus*.

The Caribbean Flamingos *Phoenicopterus ruber ruber* hatched and reared five youngsters. These were all hatched between July 21st and August 2nd. The first hatch date as per the pattern reported in last year's bird review (Wilkinson, 2000) was again later than last year but only by one day. The Chilean Flamingos *P. chilensis*, which at Chester now always nest later than the Caribbean Flamingos, hatched their first chick on August 18th (almost two weeks earlier than last year) and their last on September 16th. Four chicks were reared from the seven hatched by the Chilean Flamingos.

Great Grey Owls *Strix nebulosa* were bred for the first time at Chester. One chick was found dead shortly after hatching on May 21st but the temptation to check the nest and take any remaining chick or chicks for hand-rearing was resisted. It was then doubly pleasing when first one then a second Great Grey Owl chick eventually fledged. One Spectacled Owl *Pulsatrix perspicillata* and a White-faced Scops Owl *Otus leucotis* were also parent-reared. Our original breeding pair of White-faced Scops Owls had been very prolific and because they were considered to be genetically



over-represented the pair was split in 1996. Since then we had no sign of breeding from the new pair until 2001 when one of two chicks was reared successfully. It was thus particularly disappointing when the breeding female was found dead later in the year. The breeding of the Spectacled Owl was also of interest in that the young sire was a bird that had been fostered by the dam and following the death of its foster father had been left in the breeding aviary with its foster mother. This bird proved to be fertile at only 12 months old.

The Blue-winged Kookaburras *Dacelo leachii*, which have been in the collection since 1994, when they arrived from Rotterdam Zoo, bred for the first time at Chester. Two chicks were reared from the first brood and a further two in a second brood. A Tawny Frogmouth *Podargus strigoides* chick was reared to independence by its parents. Fischer's Turacos *Tauraco fischeri* were bred for the first time at Chester with one chick successfully hand-reared. The Red-crested Turacos *T. erythrolophus* hatched two chicks but this year failed to raise them. Two Schalow's Turacos *T. schalowi* and a Violet Plantain-eater *Musophaga violacea* were parent-reared.

Tarictic Hornbills *Penelopides* sp. were another species bred for the first time at Chester. The exact origin of the vast majority of Philippine Tarictic Hornbills held in European collections is uncertain and it is generally believed that many if not most are hybrids between what were formerly considered to be island races of one species '*Penelopides panini*' but are now treated as full species. We received a male Tarictic Hornbill from Vogelpark Avifauna, Netherlands in January. This male morphologically most closely resembles, but cannot with absolute certainty be identified as, *Penelopides affinis samarensis*. This bird was introduced to a female, an offspring from the prolific pair previously kept by Linton Zoo, that had been donated to Chester Zoo by Mike Curzon following the closure of the Tropical Bird Gardens at Rode in autumn 2000. The Tropical Bird Gardens, Paignton Zoo and Chester Zoo worked together closely and the Tropical Bird Gardens, Rode, will be greatly missed.

The new male Tarictic Hornbill is very aggressive towards people and we wondered whether he would prove to be a successful parent. The female was very keen to nest and before we had introduced a nest-box and only days after the male was introduced to her showed interest in a chamber formed by a split log on the floor of the aviary. She was discouraged from using this site and a purpose built nest that included a nest camera was quickly fixed in the aviary. Twelve days later she laid her first egg, followed two days later by a second egg and three days after that the clutch was completed with the laying of her third egg. The male was not seen to feed her and she was hand-fed in the nest by the keepers before she was observed to be occasionally leaving the box to feed herself. The eggs were removed for candling and were not returned to the nest-box as all three eggs were





Roger Wilkinson

### Chestnut-capped Ground Thrush

found to be infertile.

The Tarric Hornbill female soon showed interest in the nest-box again and 20 days after the first clutch had been removed an egg was observed in the nest-box. The female completed a second clutch of four eggs. This time the male was seen to feed the female in the nest and also to pass *Dracaena* leaves to her in the box. Three chicks were hatched and reared and these proved to be two males and one female. Male Tarric Hornbills are pied with much white on the body and head whilst the females are mainly black and this was clearly visible once the chicks grew feathers. The young female was found dead shortly after fledging. This was at the time the female was again showing interest in the nest-box and it was strongly suspected that she could have killed the female youngster. Several species of Tarric Hornbills have been reported to have helpers at the nest in the wild (summarised in Kemp, 2000). The aggressive behaviour of the adult female would not be inconsistent with a system in which young males normally remain in the natal territory to help whilst females are encouraged to disperse, and the confines of the aviary preventing the young female escaping the attentions of the adult female. However as helpers of both sexes have been reported for those species of Tarric Hornbills in which cooperative breeding has been observed this may be invalid speculation and the death of the young female remains unexplained. A third clutch of two eggs was then laid of which one egg hatched. The chick proved to be a female and as a precautionary measure it was removed from the parental aviary shortly after fledging.

Cameras were also fitted into other hornbill nest-boxes at Chester. After a number of years of failed nesting attempts by our Great Hornbills *Buceros bicornis* we became frustrated by the fact that because we did not know at what point and why their breeding attempts were failing we could do little to assist them. This really was a situation in which we were working in the

*Roger Wilkinson***White-naped Pheasant Pigeon**

dark. After the nesting female had emerged we sometimes but not always found fragments of eggshell but did not know whether the nesting attempts failed before, at, or after hatching. To reduce costs the four nest-box cameras in the Tropical Realm were all connected to a single inexpensive portable television used as a monitor and based in the bird kitchen area. A control panel then allowed scheduled scanning of the four nests or selection of only one nest for a longer period. A camera was also fitted in the nest-box of the Great Hornbill pair in the aviary inside the Asian Elephant house. This had its own television monitor located in an off-show keeper area adjacent to the aviary. Video recorders were connected to both televisions so that behaviour sequences could be recorded for subsequent analysis.

Initially a hole to accommodate the camera was made in the side of each nest-box at a position judged to be on a level with the sitting bird. It was anticipated that this would enable the observation of any eggs to determine laying dates, egg turning behaviour and subsequent clutch history. Once fitted it became apparent that the cameras emitted a low intensity light that elicited pecking from the female hornbill in the nest chamber. Accordingly the cameras were relocated in the top of the box at a position more out of reach of the bird.

A single season of use has already repaid the costs of installing this relatively inexpensive equipment. We learnt that the females of both pairs of Great Hornbills each laid a single egg. The female Great Hornbill of the pair located in the Asian Elephant building removed all the bark chips provided as nest material from her nest barrel and laid directly on the flat floor of the barrel only to sit with the egg to her side rather than cover it. As

a result of this knowledge we have modified the nest-box to both reduce its internal dimensions and to include a concave bottom into which we hope this year's egg may roll in the hope of encouraging the female to cover it. The female Great Hornbill in the Tropical Realm aviary behaved quite differently in that she did not remove the nest material and incubated her single egg. This failed to hatch and at least tells us we need to concentrate on problems associated with incubation rather than as we might have done concern ourselves with solving irrelevant problems, for example that the nesting attempt may be failing because of the parents not feeding newly hatched chicks.

The camera in the Wrinkled Hornbill *Aceros corrugatus* nest also gave us important information that assured us that the recently received nesting female was not losing condition despite her overlong stay in the nest. We also learnt that this particular female was laying eggs and showing appropriate incubation behaviour but the eggs were failing to hatch. Knowing that the male of this pair was fertile with his previous female led us to ask further questions about reproductive synchronisation between the pair and whether the female was being mated before sealing herself in the nest-box. In this case the observations inside the nest did not give us an answer but at least have prompted us to ask what we think are the appropriate questions.

Additional to the information that is of direct relevance to better husbandry and management of our captive birds is the presentation of the opportunity to collect significant scientific data on the female's moult, parental care and nestling development. We encourage students to take advantage of the research opportunities presented by these cameras and have included this as a project on the list of undergraduate research opportunities offered by Chester Zoo. In addition the opportunity is available through the use of nest monitors to show zoo visitors the hornbill nesting cycle and add to this with appropriate educational interpretation. We are encouraging our Education Department to take advantage of this opportunity.

Crested Bronzewing Pigeons *Ocyphaps lophotes* and Speckled Pigeons *Columba guinea* were bred in the free flight area of the Tropical Realm and Rock Doves *C. livia* in Europe on the Edge. More importantly a Mauritius Pink Pigeon *C. mayeri* was reared by its parents in one of the Bird Arcade aviaries. New to the collection, in January 2001, we received a pair of Green-naped Pheasant Pigeons *Otidphaps nobilis* from Vogelpark Avifauna. Later in the year a pair of White-naped Pheasant Pigeons *O. n. aruensis* was received on loan from Barcelona Zoo. A female Victoria Crowned Pigeon *Goura victoria* arrived from Bristol Zoo and later a male was received from Paradise Park, Hayle.

The St Lucia Amazons *Amazona versicolor* in Islands in Danger laid a single egg in early June but this was found outside the nest and although



removed for artificial incubation proved to be infertile. A pair of Ecuador Amazons (Lilacine Amazons) *A. autumnalis lilacina* hatched two chicks but lost these shortly after hatching. The good news was that the newly received pair of Red-tailed Amazons *A. brasiliensis* from Rode reared two chicks in the Parrot House. Other parrots bred included three Yellow-collared Macaws *Ara auricollis*, two Yellow-backed Chattering Lorries *Lorius garrulus flavopalliatus*, a Duyvenbode's Lory *Chalcopsitta duivenbodei* and two Mount Apo Lorikeets *Trichoglossus johnstoniae*.

We were grateful to receive three Chestnut-capped Thrushes *Zoothera interpres* as a donation from a private aviculturist who has been particularly successful in breeding this attractive thrush. These settled well in the free flight Tropical Realm and have already made several unsuccessful nesting attempts. In order to increase the productivity of birds in these mixed species areas where there is more competition between breeding birds than in traditional smaller breeding aviaries we remove chicks from the more accessible nests of selected species for hand-rearing. In 2001 we elected to do this to supply other zoo collections with captive-bred Red-billed Leothrix *Leothrix lutea* of which six were later donated to Paignton Zoo. Red-whiskered Bulbuls *Pycnonotus jocosus*, also in the Tropical Realm, had not reared chicks for a number of years and three were removed from a nest and hand-reared in 2001. Fifteen White-rumped Shamans *Copsychus malabaricus* were reared from two pairs by a combination of parent and hand-rearing and two Red-tailed Laughing Thrushes *Garrulax milnei* were also hand-reared.

One Yellow-throated Laughing Thrush *G. galbanus simaoensis*, two Emerald Starlings *Lamprolornis iris* and two Asian Glossy Starlings *Aplonis panayensis* were parent reared in the Tropical Realm free flight. African Pied Starlings *Spreo bicolor* raised five chicks in the Bird Arcade aviaries where Azure-winged Magpies *Cyanopica cyanea* also raised two young. Last, and if only in size very much least, some 20 Zebra Finches *Taeniopygia guttata* were bred from over prolific parents in the Finch Flight.

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## LONDON ZOO REVIEW 2001

by John A. Ellis

All in all, 2001 proved to be a busy year at London Zoo, both for birds and staff. The highlight and possibly low point of the year concerned the Seven-coloured Tanagers *Tangara fastuosa*. This beautiful species is currently classified as endangered and the fragmented wild population remains under severe threat from extensive logging and consequent loss of habitat. We were then delighted when two chicks fledged in April. However, one of these was lost eight weeks later. The pair had two further nests and a single chick was produced from the last clutch. Tragedy struck in late September when we lost the breeding female. While awaiting the results of DNA sexing, we can only hope that we have a female and that perhaps we can locate further birds held in the UK.

The colony of Black-footed or African Penguins *Spheniscus demersus* continues to grow. Apart from a short break in late summer, the birds seem to breed year round and in 2001 produced a further nine young. London Zoo, as part of the breeding programme, sent Dalmatian Pelicans *Pelecanus crispus* to Paignton and Chester Zoos in exchange for further European White Pelicans *P. onocrotalus*. This has succeeded in evening out the previous female-heavy sex ratio and now we have the foundation of a successful colony.

Hammerkops *Scopus umbretta*, which were last kept at Regent's Park in the late 1960s, are back in the collection again. The Abdim's Storks *Ciconia abdimi* failed to breed in the Southern Aviary as the result of their nests continually being taken over by Waldrapp *Geronticus eremita*. Hopefully this problem has been overcome by moving the latter to the Snowdon Aviary. Waldrapp, Little Egret *Egretta garzetta*, Cattle Egret *Bubulcus ibis* and Sacred Ibis *Threskiornis aethiopicus* all reared young in 2001. The Black-faced Ibis *Theristicus melanopis* had several nests but the eggs were always infertile. After re-sexing the birds, a doting female pairing has now been separated and we are attempting to pair one of the females with a somewhat imprinted male.

We were pleasantly surprised when two African Harrier Hawks *Polyboroides typus* fledged instead of the normal singleton produced by these consistent breeders. A surplus female was sent to the Hawk Conservancy to make up another pair of this attractive and interesting species.

A pair of captive bred Sunbitterns *Eurypyga helias* has arrived, the male from Amsterdam Zoo and the female a present from Frankfurt Zoo. The two have paired well (Sunbitterns bred at London Zoo in 1865) and are currently in the Tropical Bird House sharing the large central aviary with

the colony of Roulroul or Crested Wood Partridge *Rollulus roulroul*. The colony method seems to work well with this species, with 20 chicks hatched and a total of 11 reared successfully. Some chicks are taken after hatching and hand-reared, others are left with the parents and reared in the aviary, where most of the losses occur. It is a learning experience for the birds and the level of success rises as the females gain experience.

Pigeons and doves had a relatively successful year. We were again successful with both the Chestnut-naped *Ducula aenea paulina* and Purple-tailed Imperial Pigeons *D. rufigaster*, rearing three and two chicks respectively, and had to cap breeding Green Imperial Pigeons *D. a. aenea*. One of the most exciting arrivals was that of one male and three female Socorro Doves *Zenaida graysoni*, which came from Frankfurt as part of the EEP/ESB. This species is extinct in the wild, not having been recorded since 1972. We plan to transfer some birds between London and Bristol Zoos, leaving London with two pairs. A pair of Mindanao Bleeding-hearts *Gallilolumba criniger* was received from Bristol.

Blue-crowned Lory *Vini australis* and Mount Apo Lorikeet *Trichoglossus johnstoniae* both successfully fledged chicks, as did Blue-throated Conure *Pyrrhura cruentata*. The Black-cheeked Lovebird *Agapornis nigrigenis* colony went from strength to strength until we had no option but to remove the nest-boxes. Over 60 chicks hatched and although we did lose some shortly after fledging, by the end of the year we had sent 57 to other collections and still retain a large and active colony. A female Red-vented Cockatoo *Cacatua haematuropygia* was sent to Chester as part of the EEP.

A male Fischer's Turaco *Tauraco fischeri* was acquired to pair with the zoo's single female. The male has to be kept under observation as he is somewhat boisterous with the female. The pair produced chicks but failed to rear them. Red-crested Turacos *T. erythrophus* fledged a chick successfully, however, the following egg was abandoned and subsequently hatched in an incubator. The chick was reared using a puppet, skilfully made by keeper Patsy Joseph and readily identified with it, and shows no signs of imprinting.

During the year we lost a male Rusty-barred Owl *Strix hylophila*, sent originally from Tierpark Berlin to Antwerp in November 1978. At that time, the bird's age and origin were not recorded though it is known that it was an adult. It was at least 23 years old when it died, but could have been considerably older. We were fortunate in producing a chick from our other pair. The few Rusty-barred Owls in UK collections are mostly from stock originating from Berlin and new blood is needed to sustain the UK population. Late in the year, thanks to Chris and Alan Barnard, we eventually succeeded in pairing up our female Hawk Owl *Surnia ulula*. Surplus Spectacled Owls *Pulsatrix perspicillata*, White-faced Scops *Otus leucotis* and Rufous-thighed



Owl *S. rufipes chacoensis* were sent to other collections.

Toco Toucans *Rhamphastos toco* returned to the Regent's Park collection. Chessington Zoo sent two males bred there in 2000 and following another exchange we now have a young pair. We also managed to pair up the Black-necked Aracaris *Pteroglossus aracari*. Never having previously shown much interest in breeding, it was most encouraging that one pair went to nest, even though on this occasion the attempt was unsuccessful. We also received a pair of Keel-billed Toucans *R. sulfuratus* on loan from Charlie Mason, who had so much success with his Red-billed Toucans *R. tucanus* now at Whipsnade Wild Animal Park.

Shama *Copsychus malabaricus*, Magpie Robin *C. saularis*, Bali Starling *Leucopsar rothschildi* and White-crowned Robin-Chat *Cossypha albicapilla* all successfully reared young. Three pairs of Pope Cardinals *Paroaria dominicana* managed to produce 22 chicks and although some were lost after fledging, the final total of 16 was quite a feat. Black-breasted Thrush *Turdus dissimilis* and Red Siskin *Carduelis cucullata* both hatched chicks but failed to rear them.

We feel we have a good base on which to build in 2002 and have some exciting projects unfolding, including a European wetlands area and renovation work on the Tropical Bird House.

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## COTSWOLD HAPPENINGS

Cotswold Wildlife Park and Gardens (where the society held its Spring Social Meeting 2002) was in February 2000 asked to participate in the European Breeding Programme for the Vietnamese Pheasant *Lophura hatinhensis*. It was assigned two males from Antwerp Zoo and later received a female from a private collection in the UK.

In March 2001 a clutch of seven eggs was laid. Three were placed under a broody bantam and the remaining four were left with the female. Only three hatched and the two chicks which were reared, both males, will shortly go to other collections as part of the captive breeding programme.

The park has exhibited Great Hornbills *Buceros bicornis* in the Walled Garden since it first opened in 1970 and in 1983 was the first UK collection to breed this species. The original female died of old age in 2001, and a new female has been received from Chessington Zoo and already appears to be bonding well with the male. As part of a project administered by the Forestry Department of the Government of Thailand, the park has adopted a pair of these hornbills nesting in the wild in that country, and makes a payment towards the cost of protecting its nest site.

## LETTERS TO THE EDITOR

The article about the late Fred Shaw Mayer in Vol.107, No.3, pp. 105-108, brought the following response from Fred Barnicoat, a member since 1959 and a former Vice President, who lives in South Africa. Explaining how he came to acquire one of Fred Shaw Mayer's bound volumes of the *Avicultural Magazine*, which holds an honoured position in his almost complete set, he writes: "Through the list of members which used to be published annually, giving the name, address and date of joining of each member, I met a young Australian bird enthusiast, Peter Oderkerken, who for many years lived in Buderim, not far south of Nambour. He somehow heard about Shaw Mayer living in the retirement village and began visiting him on a regular basis. The elderly gentleman relished the companionship of a young like-minded enthusiast, and had a vast knowledge and endless fund of anecdotes to share. When at the end of 1988 Peter was due to move to Darwin, he paid him a farewell visit and as a parting gift Fred Shaw Mayer insisted on giving him his most cherished possession - his full set of the *Avicultural Magazine*, dating back from when he joined in 1922 - "so that it might not go the way of the wind". Fred Shaw Mayer died some eight months later."

"When during the 1960s I was collecting my set, mainly through W.B. Frostick, the natural history book specialist at Minster Precincts, Peterborough, a son of John Frostick, the last surviving original member of the Avicultural Society, I was told that the part most unlikely to become available was that for January 1923. That issue marked the beginning of a new series (the fourth) following the difficult years after the First World War. When, in an effort to salvage the critical situation, the Avicultural Society and La Société Nationale d'Acclimatation, of France, decided to share in the production of an ambitious series on aviculture, starting with an issue containing two colour plates, which were quite a luxury. The cost of producing that issue was, of course, exorbitant, and made possible only by the generous donations of some members. The issue resulted in a great revival of interest, membership rose rapidly and the society entered upon one of its most flourishing periods."

"Because of the high cost of producing the January 1923 issue with two colour plates, no surplus copies were printed and this accounts for its rarity. So, when in Australia in 1996, I was especially delighted when Peter Oderkerken agreed to swap his 1923 bound volume that had belonged to Fred Shaw Mayer, for my 11 loose parts in mint condition, plus a number from 1905-1912 with hand-coloured plates, that I had purchased as duplicates."

"It enabled me to fill one of the five gaps in my set. I deeply appreciate

having a book owned by the great man, one which he must have taken to New Guinea and other distant places. He had written in the front in the most beautiful handwriting: F. W. S. Mayer, "Walfruna", 88 Concord Road, Homebush. The volume is well thumbed with some of the names in the membership list - Amsler, Astley, Delacour, Ezra, Frost etc. - crossed in pencil. As well as the names, certain paragraphs are marked, most notably one in which Mr Wilfred Frost had made several journeys to New Guinea and the Aru Islands, in an article by Seth-Smith about birds of paradise."

"On my way home via Sydney, friends helped me try to trace "Walfruna", presumably the family home where Shaw Mayer grew up, but it seemed that old area of Sydney had been demolished for the construction, then in progress, of the stadium for the 2000 Olympics."

The aforementioned Wilfred Frost, another of the great collectors, joined the Avicultural Society in 1908. It was Frost who was commissioned by Sir William Ingram to collect Greater Birds of Paradise *Paradisaea apoda* from the Aru Islands for release on the Caribbean island of Little Tobago, which he purchased for these birds when it was feared that the species might be exterminated from New Guinea and the Aru Islands by the millinery trade's demand for its plumes. Forty-eight were released on Little Tobago in 1909 and in 1912 a further three were released.

In June 2001, shortly after returning from a visit to Trinidad and Tobago, Rosemary Low wrote to tell me that contrary to what I had written previously, Greater Birds of Paradise no longer exist on Little Tobago, having been extirpated by Hurricane Flora in 1963. Apparently the Government of Trinidad and Tobago approached the Indonesian Government about importing replacements but its request was not granted. However, the remains of the introduction cage which was optimistically built, can still be seen on Little Tobago.

When I was in London last October, I had lunch with Don Newson, formerly Head Keeper and then Overseer of Birds at London Zoo until his retirement, from whom I learnt that Frost had been a scenery shifter in the theatre, who had started out catching British birds, such as Goldfinches *Carduelis carduelis*, as a sideline.

I was working at the zoo and met Wilfred Frost when he brought over his last collection, which included four male Greater Birds of Paradise, their long plumes stained dark red by the wood shavings on the floors of the boxes. I also learnt that from Don that Frost had a son, who had lost an arm while serving in the Navy during the war. The son lived in Ealing, west London, and Frost stayed with him when he was in London.

Wilfred Frost died shortly after leaving for Borneo on what would have been his 54th expedition. He was aged 82.



## BIRDS AND AVOCADOS

Rosemary Low writes: "Avocado as part of the diet of quetzals, bellbirds and umbrellabirds was mentioned in Vol.107, No.3, p.140 (2001). The statement that the flesh and stones of avocados are toxic to parrots, or to some parrots, was included. I have seen the tiny avocados no more than 5cm (approx. 2in) long, eaten by quetzals in the cloud forest of Monteverde, Costa Rica. They bear little resemblance to the cultivated fruits that we buy. Whether their chemical composition is the same I do not know. However, I do know that avocados can kill parrots. Let me quote information from the internet published in *Parrots* magazine, February/March 2000 issue":

"On Tuesday we were eating supper with our African Grey Parrot 'Monty'. I only gave him a little piece of green avocado flesh. I was unaware that avocado is unhealthy for birds. We spent the whole night up with him, giving him supportive care but the toxicity was just too much for his body. He passed away on Thursday morning at 8.00 a.m."

"We would like to let as many people as possible know that avocado is extremely toxic for birds. 'Monty' passed away at the young age of seven years. He had never been sick..."

In an attempt to learn more, I contacted the Royal Botanic Gardens, Kew, and received a reply from Jill Turner, Centre for Economic Botany (website: [www.rbgekew.org.uk/ceb/](http://www.rbgekew.org.uk/ceb/)). About the poisoning of birds by avocado pears *Persea americana*, she wrote: "It seems that as long ago as 1989, studies had shown that avocado fruits could kill budgerigars and in 1994, ostriches. There are also many reports of their leaves causing the deaths of various grazing and foraging animals." Adding later: "Some humans also have to avoid avocados - those who have a latex allergy may experience a reaction to them, sometimes severe enough to provoke anaphylactic shock."

She was kind enough to print out three pages of information retrieved from the website - [www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov) - of the US National Library of Medicine. In one experiment, avocados of two varieties were mashed and administered to eight canaries and eight budgerigars. Six of the latter and one of the canaries died within 24-47 hours. Results indicated that avocados are highly toxic to budgerigars and less toxic to canaries. Post mortem findings observed in some birds included subcutaneous edema in the pectoral area and hydropericardium. (Avocado (*Persea americana*) intoxication in caged birds. Hargis, A. M., Stauber, E., Casteel, S., Eitner, D. Washington Animal Disease Laboratory, College of Veterinary Medicine, Washington State University. *J Am Med Assoc.* 1989 Jan 1;194 (1):64-6).

In another experiment pairs of budgerigars were given samples of plants

considered potentially toxic to pet birds. Of the 19 plants tested, only six induced clinical signs of illness; these plants were yew *Taxus media*, oleander *Nerium oleander*, clematis *Clematis* sp., avocado *Persea americana*, black locust *Robinia pseudoacacia* and Virginia creeper *Parthenocissus quinquefolio*. (Evaluation of selected plants for acute toxicosis in budgerigars. Shrophire, C. M., Stauber, E., Arai, M. Department of Veterinary Clinical Medicine and Surgery, College of Veterinary Medicine, Washington State University *J Am Vet Med Assoc.* 1992 Apr. 1;200 (7):936-9).

Nine out of 120 ostriches died from congestive heart failure within 96 hours of ingesting avocado leaves and immature fruits in an avocado orchard containing Hass and Fuerte cultivars. (Cardiomyopathy in ostriches (*Struthio camelus*) due to avocado (*Persea americana* var. *guatemalensis*) intoxication. Burger, W. P., Naude, T. W., van Rensburg, I. B., Botha, C. J., Pienaar, A. C. Ostrich Research Centre, Oudtshoorn, Republic of South Africa. *J SAfr Vet Assoc.* 1994 Sep:65(3):113-8).

Jill Turner also sent photocopies of the page-and-a-half on the Avocado from a comparatively new book, *Toxic Plants Dangerous to Humans and Animals* by Jean Bruneton, Professor of Pharmacognosy at the University of Angers (France) School of Pharmacy. According to this the toxicity appears to be associated with only the Guatemala variety, its cultivars (e.g. Hass, Anaheim, Reed) and the Fuerte cultivar (*drymifolia* x *guatemalensis*). The exact nature of the toxic substance was unknown for a long time but, in 1994, a method was published for assessing avocado toxicity. The toxin is in fact an ester of a C<sub>21</sub> fatty alcohol, (2*R*)-(12*Z*, 15*Z*)-2-hydroxy-4-oxoheneicos-12,15-dienol acetate, already isolated in 1975.

There is no known antidote. The onset of edema is an indication for prescribing corticosteroids and diuretics.

On the subject of humans and avocados, the author writes: "...those patients treated with some MAO inhibitors (monoamine oxidase inhibitors) must exercise moderation" and cites the example of a 35 year old man undergoing this type of treatment who had a hypertensive crisis after eating four avocados that must have been very ripe. He concludes: "This incident was probably induced by the fact that avocado contains a large quantity of tyramine, an amine normally degraded by the MAO."

Jill Turner concluded her letter: "In view of the personal and monetary value of parrots, other caged birds and dogs to their owners, the dangers of feeding avocado pears to these animals should be more widely known."

## BOOK REVIEWS

### HOPE IS THE THING WITH FEATHERS

One of the most poignant books you are ever likely to read *Hope is the thing with feathers* - is a unique account of the extinction of six North American bird species. It is not a cold scientific record but an imaginative and thoughtful book. Christopher Cokinos is an award-winning author and a professor of English at Kansas State University. One September afternoon in Kansas he saw an escaped parrot and this led him to research the extinct Carolina Parakeet, which once coloured the sky "like an atmosphere of gems".

His research prompted him to ask: "How could we have lost and forgotten so beautiful a bird?" In an attempt to answer that question and in an effort to make certain that we never again forget this species, he set about writing an account of the demise of this parakeet, plus the five other species. His painstaking research has resulted in this fascinating book, illustrated with black and white photographs and other pictures of extinct species and historical events. The most shocking one (though doubtless commonplace at the time) depicts a woman's hat decorated with a dead Carolina Parakeet. Surely the saddest one is that which shows a Mr Bryan with his pet Carolina in 1906. Like any tame conure, it is sitting on its owner's chest, snuggling close to his face. Only 12 years later, the last Carolina Parakeet known to exist died at Cincinnati Zoo. She is said to have died from grief after her mate of 32 years passed away.

Today it might seem incredible that the opportunity to breed this species in captivity was neglected but times were different then and the word conservation was unknown in the context we use it today. Among the many fascinating stories that surround the decline and demise of the Carolina Parakeet is that of film purported to have been taken in Georgia's Okefenokee Swamp in 1937. When this colour film was presented in 1970 at a meeting of the American Ornithologists' Union, the audience watched carefully, but no one could say if the birds depicted were Carolina Parakeets.

I suspect that it is more likely that they were escaped aviary birds of another closely related species of *Aratinga* conure, such as the Jendaya. Whenever I read about the Carolina Parakeet, the omission of one fact that would surely be obvious to anyone closely associated with parrots, always surprises me. The Carolina was so obviously a *Aratinga* conure, yet everyone seems to have missed the fact that as long ago as 1826 this parakeet was classified with the *Aratinga* species. The name of the genus was changed to *Conurus*, then back to *Aratinga*. Probably towards the end of the nineteenth century, someone decided to change the generic name of the Carolina to



*Conuropsis*. Soon after this the species became extinct - and the name stuck. Despite all his research, Cokinos makes no mention of this. Generally speaking *Aratinga* conures are not difficult to breed in captivity. If they had lingered on for a few more years, could they have been saved by captive breeding? Perhaps not. Some species are doomed when their numbers fall below a certain level because they needed large flocks as a stimulus to breeding, as in the case of the Passenger Pigeon.

The other species covered are the Heath Hen, Passenger Pigeon, Labrador Duck and Great Auk. Finally, there is the Ivory-billed Woodpecker, so recently extinct that it is included in that indispensable volume *Threatened Birds of the World*. However, as Christopher Cokinos comments, it "may not be extinct although it has vanished from the gaze of all but a few..."

With interest in extinct species being rekindled by a couple of recent TV series, this book is a timely addition to the literature. It should be read by everyone who cares about the plight of birds today, though I must admit that I found it depressing. Unfortunately, we are now witnessing the start of an era of mass extinction in which many more birds species will be lost. Perhaps these tragic stories, so skillfully related, will help to prevent the extinction of another half dozen (6) bird species. Some are perilously near the edge and this book might provide the inspiration that will save them.

*Hope is a thing with feathers* (ISBN 1-58542-006-9), 360 pages, is published by P. Tarcher/Putnam of New York.

**Rosemary Low**

## CHATTER OF CHOUGHS

OK, here is a break from aviculture. Or, perhaps not, for aviculturists look after birds because they love birds, not aviculture! So, in this respect, we are no different to birdwatchers or ornithologists. It is just that we study them at closer quarters, and notice different things. To find out about life patterns. Protect them. Breed them. Secure them. Pamper them.

So this is a book that will not worry you or make you feel inadequate. No feeling of "Oh, if I'd done that..." or "Maybe I should do that next season" or "Should I try this species or that species?" Instead you can sit back, and in odd moments dip into this delightful anthology of poems, essays and cartoons, all dedicated to the Red-billed Chough, or as many of us still think of it, the Cornish Chough.

When I imply that it would not make you feel inadequate, I should perhaps say that it may make you feel a little literately inadequate, for this slim volume of 128 pages is chocker with charming, amusing contributions. All of a very high standard, by contributors who are all connected with St

Edmund Hall, Oxford - which has four Choughs on its coat-of-arms (to find out why you will have to get the book!). The contributors include Terry Jones (of Monty Python) and renowned poets, including Tom Paulin, Kevin Crossley-Holland, John Powell Ward, David Constantine, Bernard O'Donoghue and Jenny Lewis. So this might be temptation enough.

The abundant illustrations come in a wide range of styles, some which may not totally impress our esteemed Editor, but all are funny, clever or evocative. Some of the cartoons remind me of Guy Troughton's work in those great little Whittet Books.

And when the entertaining is done, there's a heap of learning too. Everything you never knew you wanted to know about the history, folklore and mythology of this remarkable bird. Short on natural history perhaps but, like I say, that's not the point. It is a break from all that. And I doubt you will find a more treasured one.

*Chatter of Choughs*, A St Edmund Hall Anthology, is published by Signal Books Ltd., Oxford. The softback edition is priced £10 and the hardback £20. Copies are available from Lucy Newlyn, St Edmund Hall, Oxford OX1 4AR, UK (website:www.seh.ox.ac.uk).

**Dr Richard Meyer**

## **HANDBOOK OF THE BIRDS OF THE WORLD**

If anything, number six of this monumental series is more stunning than its predecessors. Of course it helps to have a volume devoted almost entirely to some of the world's most colourful and spectacular birds - kingfishers, bee-eaters, rollers, trogons and hornbills among them. By contrast with these dandies, the mousebirds look positively drab.

The sheer volume of high quality material available for this latest volume presented the publishers with a considerable dilemma and they have devoted some two pages to explain how they resolved the problem. The material in question has been split into two parts - Volume 6 (Mousebirds to Hornbills) will be followed in April by Volume 7 (Jacamars to Woodpeckers), with passerines starting at what will be Volume 8. As a result of these changes we are not quite at the half-way stage of what was planned originally as a 12 volume work, but has recently been increased to 16. The publishers looked at various options and eventually decided to poll readers in order to ascertain their views: (a) that future volumes should continue to be as comprehensively illustrated as possible or (b) to cut costs where necessary by including fewer photographs and illustrating fewer subspecies on the colour plates, as well as imposing strict word limits on authors. Ninety-three percent of readers polled want future volumes to continue to be as comprehensive and fully illustrated as possible, therefore nine volumes will be devoted to passerines.

In Volume 6 the HBW team has succeeded in carrying out a trial on a long-term aim of encouraging good photographers to go out in search of photos of species for which it has none of publishable quality. "On this occasion, Brian Coates very kindly agreed, at very short notice and with very modest funding, to travel to Sulawesi in search of photos for some elusive species. We are delighted to report that the results of this experiment include a fine series of shots, of which we are very happy to be publishing a selection in this and forthcoming volumes", said a spokesman. Examples of Brian's work can be found among the kingfishers, rollers and hornbills.

Layout remains the same of course, with lengthy family introductions providing much general information on Systematics, Morphological Aspects, Habitat, General Habits, Voice, Food and Feeding, Breeding, Movements, Relationship with Man, Status and Conservation. Species accounts, which are accurate and up to date, are provided under the headings, Taxonomy, Subspecies and Distribution, Descriptive Notes, Habitat, Food and Feeding, Breeding, Movements, Status and Conservation, plus a short bibliography appropriate to individual species. The 45 colour plates - the work of Richard Allen, Francesc Jutglar, Lluís Sanz, Norman Arlott, Douglas Pratt, Jan Wilczur, Hilary Burn, Chris Rose and Tim Worfolk maintain the high standards achieved in previous volumes. As usual, distinctive subspecies are also illustrated.

The photographs in Volume 6 provide irrefutable evidence of the importance of maintaining the status quo. They are of outstanding quality and while I have not checked every caption I believe the emphasis is solidly on the work of field rather than studio photographers. My personal favourites (not in any particular order) are: Resplendent Quetzal at nest (p. 95); Southern Ground Hornbills feeding on zebra (p. 469); Von der Decken's Hornbills with Dwarf Mongoose and Superb Starling (p. 451); Green Woodhoopoes at nest (p. 419); Long-tailed Ground-Roller (p. 384) and Red-faced Mousebird drinking (p. 69). Just about every facet of behaviour is captured in more than 380 photographs. That is what sets apart the photographs in all volumes, the fact that subjects are invariably engaged in activity of one kind or another - feeding, preening, displaying and rearing young.

As usual this is as good as you are likely to get. It is now simply a question of looking forward to further superlative volumes, for everyone who has made the acquaintance of those so far published will surely want to complete the set!

*Handbook of the Birds of the World* Volume 6, Mousebirds to Hornbills, is priced £110. Further information, samples and ordering are available online at: [www.hbw.com](http://www.hbw.com). Lynx Edicions have a new address: Montseny, 8, E-08193 Bellaterra, Barcelona, Spain. Tel: +34 93 594 77 10/ Fax:+34 93 592 09 69/E-mail: [lynx@hbw.com](mailto:lynx@hbw.com)

**Frank Woolham**



## NEWS & VIEWS

### PITTA BRED

Burgers' Zoo, Arnhem, the Netherlands, last year bred an amazing 26 Hooded Pittas *Pitta sordida*, of which just three failed to survive. Other birds bred included 17 Black-footed or African Penguins *Spheniscus demersus*, of which just three failed to survive and 30 Striated Herons *Butorides striatus* of which two failed to survive.

It also acted as a 'dating centre' for Great Hornbills *Buceros bicornis* from Amsterdam, Antwerp, Arnhem and Rotterdam Zoos, at the end of which some were re-paired. There were approximately 100 birds when the Great Hornbill EEP (European Species Survival Programme) was initiated 10 years ago, since when 30 adults have died and 15 chicks have hatched, of which 10 have survived. Only a couple of pairs have bred consistently, and their young may become over-represented in the near future.

\* \* \*

### FROM WCS ANNUAL REPORT

The Wildlife Conservation Society (WCS) (website: [www.wcs.org](http://www.wcs.org)), New York, manages the world's largest system of urban wildlife parks, led by the flagship Bronx Zoo. Parrots and pheasants at the Bronx have been trained to perch on a scale, eliminating the need to catch the birds to weigh them and its flock of young American or Caribbean Flamingos *P. ruber ruber* have been trained to enter their shelter at the sound of a whistle.

At the WCS's Queens Zoo construction began on a Thick-billed Parrot *Rhynchopsitta pachyrhyncha* exhibit, and the zoo recorded its first successful hatching of this species (one of six during 2001 in the USA). Kori Bustards *Ardeotis kori* were introduced to the St. Catherines Wildlife Survival Center in the late 1980s in the hope that the hot Georgia climate and open spaces would be conducive to breeding. Despite males drumming and performing breeding and territorial displays though, no eggs were laid. However, following studies of bustard habitat in Namibia, changes were made to the birds' enclosure and in June 2001, an egg was laid and artificially incubated. It hatched in July.

A female Maleo *Macrocephalon maleo* dug her nest in the sandy substrate beside the artificial site created for her. As a result the single egg was undetected during the incubation period lasting 80 days, and the sudden appearance of the chick came as a great surprise. It represents the second generation of Maleos hatched at the center, the only collection to hatch this species from Sulawesi in captivity.

\* \* \*

## WITHOUT A BIOLOGY DEGREE BETWEEN THEM

Spix's Macaw *Cyanopsitta spixii* is almost certainly extinct in the wild, the last remaining male not having been seen since October 2000. A female released into his area in 1995 died after hitting a power line a few months after being released.

All but the most knowledgeable will, I suspect, be surprised to learn that there are as many as just over 60 of these birds living in captivity, which would seem to be more than enough to establish a captive breeding programme, with the aim of eventually reintroducing this species back into the wild. However, Rosemary Low points out that genetically the pool is very small because so many are offspring from probably just one or two pairs belonging to Antonio de Dios in the Philippines - and are therefore related. Furthermore, many of the captive birds are owned by strong-willed, wealthy individuals, who seem unwilling to cooperate on terms other than their own.

This was the main theme of the cover story of *Times 2*, a section of *The Times* newspaper (Friday, January 11th 2002). A colour photo of a pair of Spix's Macaws adorned the cover, the species the subject of what was described as a story about "The good, the rich and the egotistical - Why human vanity threatens the survival of the world's rarest bird", with Giles Whittell's investigation on pages 1 & 2 headlined "Battle of the bird breeders".

Things came to a head when contrary to an agreement signed at a meeting in Houston, Texas, in 1999, whereby all transfers of Spix's Macaws between breeders or zoos would be approved by the Permanent International Committee for the Recovery of Spix's Macaw (CPRAA) set up by the Brazilian Government, Antonio de Dios of Birds International Inc., in the Philippines, transferred four macaws to the collection of Sheikh Saoud Mohammed Bin Ali Al-Thani, a member of the ruling family of Qatar, who is not a signatory to the CPRAA agreement. Amongst other rare birds, the Sheikh is also said to own several Lear's Macaws *Anodorhynchus leari*. Recently, Al Wabra Wildlife Preservation, owned by the Sheikh, advertised for a Bird Curator, whose qualifications were to include familiarity with the breeding of parrots, in addition to which, a knowledge of birds of paradise, would be appreciated!

What seems to have especially incensed Wolfgang Kiessling, owner of Loro Parque, is that the transfer was allowed or perhaps even encouraged by Natascha Schischakin, at the time a representative of Houston Zoo, who for most of the 1990s served as the International Studbook Keeper for this species. Recently relieved of her Spix's Macaw conservation duties, she is quoted as considering the home that the Sheikh has created for his macaws "impeccable" and, Dr Nigel Collar, of BirdLife International, is said to have

met the Sheikh and found him “wholly genuine” and sees no reason to doubt his sincerity as a conservationist. The Loro Parque Fundación, which over the years is stated to have contributed US\$600,000 (over £400,000) to the recovery programme, has suspended its funding of the committee’s field programme and will no longer participate until the recovery committee is significantly reformed, and a commitment clearly made to the principals of clarity, transparency, fairness, and adherence to the agreed rules and procedures.

Loro Parque has three Spix’s Macaws. Antonio de Dios is said to now own 27 and seems to be the most successful breeder. A further 18 are owned by Roland Messer and are housed in his private aviaries in northern Switzerland. He is said to have bought 15 for £70,000 (almost US\$100,000) from their previous owner, a Swiss dentist. According to a report in *Cyanopsitta* No. 60 - March 2001, Joseph Hämmerli, the dentist, owned 20 originally, and others went to Adolf Indermauer and a Mr Itten, neither of whom are signatories to the CPRAA agreement.

According to the account in *Times 2*, Roland Messer believes that his seven pairs are capable of producing more than 200 young over the next five years, and when he has 250 he will give half of the offspring every year to the CPRAA. Antonio de Dios is said to have similar plans and both are said to have the backing of Natascha Schischakin.

There is, it seems, one Spix’s Macaw in São Paulo Zoo, Brazil, the only one worldwide of the 60 or more on exhibition to the public. Writing in the UK weekly magazine *Cage & Aviary Birds* (June 2nd, 2001), Rosemary Low described the breeding of a further pair, this pair belonging to Mauricio Ferreira dos Santos, at Criadero Chapparal, Recife, Brazil (not mentioned in *Times 2*), that reared two chicks in 2000. The male of the pair originates from the last confiscation from Paraguay. The two confiscated macaws were sent to São Paulo Zoo and the male ultimately went to Mauricio Ferreira dos Santos’ private collection and was joined by a young female bred by Antonio de Dios. Of great importance is the fact that the male is probably unrelated to those in the Philippines and Switzerland.

In *Times 2*, much was made of the fact that most of these birds are in the hands of private individuals “without a biology degree between them” and the international conservation community is said to be “begging them to leave the saving (of Spix’s Macaw) to the experts”! Whereas it is questionable whether one needs a biology degree to be a successful parrot breeder, surely every member will agree with the part of Dr Nigel Collar’s statement where he is quoted as having said: “...We need everyone with a Spix’s Macaw sitting at a table agreeing on a plan thought through by experts...” No names are put forward as to who these experts might be - perhaps members would like to come up with one or two names !



## RED DATA BOOK

*Threatened Birds of Asia: The BirdLife International Red Data Book*, in two volumes and described as “an essential reference source for anyone with an interest in birds and conservation in the Asian region”, has recently been published, price £55. There is also a CD-ROM at £12. Further information is available from: NHBS Ltd., 2-3 Wills Road, Totnes, Devon TQ9 5XN, UK. Tel: +44 (0) 1803 865913/Fax: +44 (0)1803 865280/Website: [www.nhbs.com/birdlife.html](http://www.nhbs.com/birdlife.html)/E-mail: [nhbs@nhbs.co.uk](mailto:nhbs@nhbs.co.uk)

\* \* \*

## NATIONAL SUCCESS

Stewart Pyper writes: “The 58th National Exhibition of Cage & Aviary Birds was held Saturday-Sunday, December 1st-2nd 2001, at the National Exhibition Centre, Birmingham. Judged best exhibit in the show, best foreign bird and best nectar-feeder was the Streaked Spiderhunter staged by the father and son partnership of B. and A. Howlett, well known keepers, breeders and exhibitors, and keen supporters of the National Exhibition. Bernard Howlett is a member of the Avicultural Society. Second best foreign bird was the Grey-backed Thrush, as steady as a rock, shown by M. and C. Brown. In third place was the normal Peach-faced Lovebird benched by D. Watlow.”

“The sunbird class with an entry of 31 was headed by J. P. Faulkner’s Malachite Sunbird, followed by an Amethyst and a Tacazze Sunbird. It was a very difficult class to judge. Best small softbill and most artistically staged foreign bird, was A. and M. Tugman’s Rufous-tailed Robin. Best large parrot-like was the Ring-necked Parrakeet owned by R. Lewis. An excellent male Star Finch, perhaps the best I can recollect, was judged best Australian finch. It was benched by Mr and Mrs G. Nancarrow.”

“A Silver-breasted Broadbill, a steady bird in good condition, attracted a great deal of attention as it was perhaps the first time this species has been shown. There was also a selection of owner-bred foreign birds, just the tip of the iceberg of those bred in the UK.”

“There was a good display of trade stands and an isle with all the club stands. This was where the society had its stand. The total number of new members who joined and lapsed members who rejoined the society was 13, while 15 members took the opportunity to pay their 2002 subscriptions, making it our best year yet. Scott Appleton again covered the cost of the stand and the society is once again most appreciative of his generous help. I would also like to thank those who helped run the stand.”

“This year’s National Exhibition will be held November 30th - December 1st. It is hoped the society will again have a stand at the exhibition. Anyone willing to help run it should telephone 01373 836293 or write to me at my address which can be found on the inside front cover of the magazine.”

## **BANDING TOGETHER**

Hunting hornbills for their feathers has become unsustainable in many areas of Sarawak, Malaysia, leading to the depletion and even the extinction of some local hornbill populations, especially of the Helmeted *Rhinoplax vigil* and Rhinoceros Hornbill *Buceros rhinoceros*. In an innovative approach to help protect these hornbills, the WCS (Wildlife Conservation Society) Malaysia Programme Coordinator Elizabeth Bennett, working with Bronx Zoo Curator of Ornithology Christine Sheppard, is providing the local people with turkey feathers, with a black band painted across them so that they look like hornbill feathers, so there is no longer the need to hunt wild hornbills for their tail feathers. The painted feathers are usually culturally acceptable, though there are a few ceremonies that, for spiritual reasons, require real hornbill feathers. To meet this need, North American zoos, in a cooperative effort led by the WCS, are supplying the indigenous peoples with hornbill feathers moulted by birds in their collections. Feathers are worn by the men in traditional hats and occasionally in capes, and by the woman during dances.

\* \* \*

## **DODO'S NEAREST LIVING RELATIVE**

A DNA test on the mummified remains of the Dodo said to have helped inspire Lewis Carroll's *Alice in Wonderland* has confirmed that the Dodo was indeed a species of pigeon. The study, led by Dr Alan Cooper, Director of the Henry Wellcome Ancient Biomolecules Centre, Oxford University, concluded that the Dodo's nearest living relative is the Nicobar Pigeon *Caloenas nicobarica*.

\* \* \*

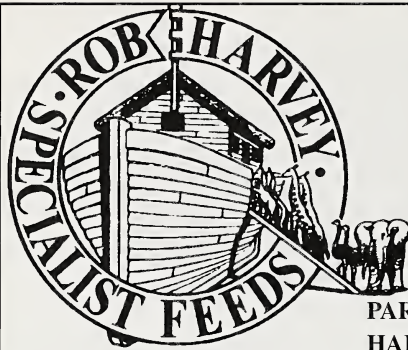
## **DECEMBER 1916 - OCTOBER 2001**

Chester's *Zoo Life* Winter 2001 - Issue 8, included an obituary to Muriel Florence McCann. She was the eldest daughter of George and Elizabeth Mottershead, the founders of Chester Zoo. Except for service in the Navy during the war, she worked at the zoo until on a trip around the world, she met and in 1956 married Charles McCann a Curator at Wellington Museum, New Zealand. Her father was a Vice President of the Avicultural Society 1962-1978.

\* \* \*

## **AVICULTURAL MAGAZINE BACK ISSUES**

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