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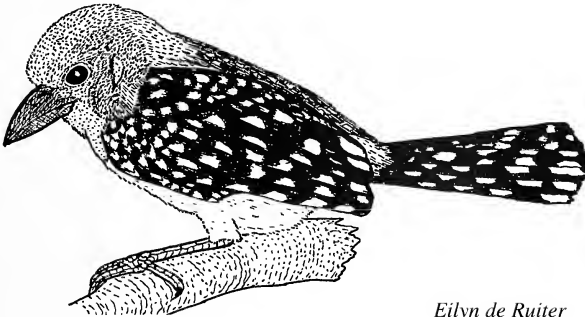
BREEDING THE RED & YELLOW BARBET IN CAPTIVITY

by Maarten de Ruiter

Introduction

Although barbets of different species are offered for sale with some regularity, they have never been as popular as many other softbills. They are though very interesting birds and fortunately several private and public collections keep them and several species have been bred.

The Red & Yellow Barbet *Trachyphonus erythrocephalus* is a member of an African genus of some six species. The others are: the Yellow-billed *T. purpuratus*, Levaillant's (often called the Crested in its native countries) *T. vaillantii*, d'Arnaud's *T. darnaudii*, Usambiro *T. usambiro* and Yellow-breasted *T. margaritatus*.



Eilyn de Ruiter

Three of these - Levaillant's, d'Arnaud's and the Red & Yellow - are relatively well-known in aviculture and one, the Usambiro, is so far as I know, completely unknown in aviculture.

In the wild

The Red & Yellow Barbet is a medium-sized bird about 23cm (9in) in length. It lives in eastern Africa and has a number of subspecies:

<i>T. e. erythrocephalus</i>	s. Kenya, n. Tanzania.
<i>T. e. gallarum</i>	s. & c. Ethiopia.
<i>T. e. shelleyi</i>	e. Ethiopia, n. Somalia.
<i>T. e. versicolor</i>	n. Uganda, w. Kenya.
<i>T. e. jacksoni</i>	s. Ethiopia, n. & c. Kenya.

These are found in semi-arid bush country and open thornbush. The presence of termite mounds (termitaria) is important because they like to excavate their nest holes in these. Banks, including those of dry river-beds, may also be used for nesting in. They live in small groups that even during the-breeding season remain intact. One pair breed and the other members of the group act as helpers.

The barbets' main food is insects and small vertebrates such as lizards are also taken. In captivity a good brand of insectile food mixed with some finely chopped or minced (ground) meat can form the basis of their diet, plus some fruit and livefood as an added extra. When they are feeding young in the nest, livefood is a must.

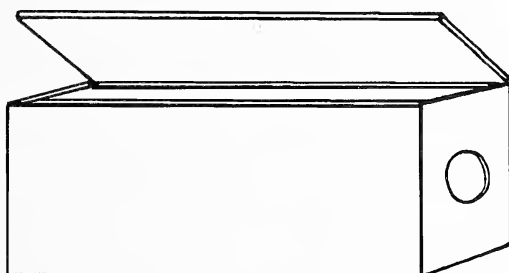
Captive breeding

In recent years the Red & Yellow Barbet has been imported in quite large numbers and has been bred in several public as well as private collections. The first account of captive breeding I have been able to find is that of M. D. England (1973). In the mid-1990s the number of breeding successes suddenly rose dramatically. I know of breedings in the collections at Metelen, Walsrode, Leipzig and Münster and by Sehburger in Germany, at Denver, USA, Cambron, Belgium, at Rotterdam and by B. Fregeres in the Netherlands, and at Copenhagen, Denmark. It is a pity that of these ten, notes were published about only four of them, those at Metelen, Denver, Cambron and by B. Fregeres. Unfortunately, zoological collections in general rarely publish articles about breeding successes with their smaller birds. There are exceptions, of course, such as Chester Zoo.

Derrick England's pair was housed in a combined indoor/outdoor aviary. The indoor part measured 1.8m x 1.5m x 2.5m high (approx. 6ft x 5ft x 8ft high), with a 6.1m (approx. 20ft) long outdoor flight. A 25.4cm x 25.4cm x 18cm (10in x 10in x 7in) nest-box was provided and used for roosting in. Later, during the breeding season, a bale of tightly compressed peat in which Derrick England had constructed a tunnel and a nesting chamber was placed in the aviary as a possible nesting place. In addition, five different nest-boxes were provided. It was in one of these that the pair nested. The box was not inspected, therefore it was not known how many eggs were laid or how long incubation lasted, but it was known that it was shared by both birds. The time the young remained in the nest was also unknown. According

to Derrick England: 'by 17th April the nest undoubtedly contained young', however, shortly afterwards he wrote: 'by 7th April a youngster was looking out of the hole and two days later it was out'. There appears to have been an error over that date or the earlier date somewhere along the line in the preparation of the article. Eventually two young left the nest and were recognisable as being a male and a female. The latter did not look very well and died at five or six weeks of age. The young male thrived and was raised successfully.

At Vogelpark Metelen a pair was received in 1993. Together with some White-fronted Bee-eaters *Merops bullockoides* they were housed in an indoor aviary in the Tropical House. The back of this enclosure was constructed to resemble a riverbank and several nest-boxes (see diagram below) were



The nest-boxes, which were filled with a sand-loam mixture, measured 75cm x 30cm x 30cm (approx. $29\frac{1}{2}$ in x $11\frac{3}{4}$ in x $11\frac{3}{4}$ in) and had a 9cm ($3\frac{1}{2}$ in) hole

concealed in it. After some aggression towards the bee-eaters, the barbets started to nest in one of these boxes. During a four day period four eggs were laid, and 15 days after the last egg was laid, three chicks hatched. A lot of extra livefood was provided and all three were raised and left the nest after 23 days. The male took care of them after they left the nest and the female started to look for a new nest site. Four days after the young left the nest, the first egg of the second clutch was laid. Again the complete clutch contained four eggs. All four hatched and while the parents were looking for food, the young male from the first clutch (the other two were females) entered the nest to brood the second lot of young (Gerstner and Berse, 1994).

During 1994-1996, while working at Cambron-Casteau, I was able to make some interesting observations on the breeding of the Red & Yellow Barbet (de Ruiter, 1997, 1998). When I started working at this park, there was a group of eight barbets and as at Metelen, an artificial riverbank had been constructed, in this case in a corner. The barbets shared the desert-like habitat in the greenhouse with roadrunners, rollers, starlings, weavers, babblers and a bee-eater. Nest holes had been placed in the artificial riverbank

like those at Metelen. The Belgian birds however produced larger clutches of five to seven eggs, though usually no more than four hatched. Raising the young was usually relatively straightforward and during the two breeding seasons I worked at Cambron no less than 20 young were raised. Due to escapes and aggression, however, many were lost.

The Dutch aviculturist B. Fregeres obtained his first pair in 1997 and a year later a second pair was bought. These were housed beside each other in two similar aviaries each measuring 2.5m x 1m x 1.9m high (approx. 8ft x 3ft 3in x 6ft 3in high). One pair was provided with a normal nest-box, but with an entrance pipe filled with pressed wood chips. The other pair had a nest-box filled with rotten birch wood. The first pair produced a clutch of three eggs but only one hatched after about 14 days and the young barbet remained in the nest for about 28 days. The second pair also laid three eggs of which two hatched. While the second pair were incubating their eggs the first pair's youngster left the nest, after which the two pairs started to attack each other through the wire between their adjoining aviaries. Thick plastic sheeting was placed between the two aviaries and in this way peace was restored and both pairs went on to raise their young successfully.

At Denver Zoological Gardens clutches varied between three and four white eggs. There was an average of 3.6 eggs per clutch, from 10 clutches, with a typical pattern of a clutch of four followed by a clutch of three. Incubation lasted 13 days from the date the last egg was laid. The chicks fledged in 28 days, by which time they were fully feathered and capable of being sexed and able to fly (Schmitt and Lyvere, 1980).

Conclusion

The Red & Yellow Barbet has proved to be a good aviary bird that will breed in captivity. Hopefully, those breeding this species will get in contact with each other and attempt to establish a stable captive breeding population.

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OBSERVATIONS ON SEED-EATING PIGEONS

by Philip Schofield

Having kept various seed-eating pigeons since 1967, it seems appropriate to record some of my experiences with this group of birds. It all started in August of that year, when, at the age of 13, I selected a pair of doves (paying £1 (approx. US\$1.50) for the pair) from a cage full of Barbary Doves *Streptopelia risoria* dom. in a local pet shop. The female was a typical fawn Barbary Dove, her mate an apparent hybrid with a European Turtle Dove *S. turtur*. While they quickly became a devoted couple, the female never produced an egg, appearing to have some internal trouble that prevented her from laying. However, the pair used to go to nest and sit devotedly on an empty nest. They readily adopted eggs of other birds provided by me and reared at different times a Turtle Dove and several domestic pigeons *Columba livia* dom. of the small Budapest Roller breed. I gave them only a single pigeon egg at a time, feeling that two comparatively large foster squabs might be too much for them; even a Budapest Roller is rather larger than a Barbary Dove. The female Barbary Dove was hand-tame from the start, and could be carried about without fear of her flying away. She once flew to the top of a 40ft (approx. 12m) Oak, but quickly returned to be picked up from the aviary roof. Due to her complete lack of fear, she could never be left alone outside in a built-up area with many cats and dogs. The hybrid male, on the other hand, remained relatively flighty and unapproachable for many months after purchase. Eventually he got out and I expected never to see him again. However, after visiting neighbours' gardens and being heard calling from all points of the compass, he returned to the aviary and walked in when I held the door open. After that, I often let him out, and a pattern of behaviour developed. He would hang around the garden for a few minutes, then head at speed for some tall conifers some 500yds (approx. 450m) away, where a pair of Collared Doves *S. decaocto* lived. The Collared Doves would then rocket out of the tree, pursued by the hybrid, and all three would fly at speed over the neighbouring golf course and disappear into the distance. Minutes or hours later, the hybrid would be back on the aviary roof, displaying to his mate and ready to be let back in. His aggressive tendencies were also directed at my free-flying domestic pigeons, and he could always move them on when he tried to. Smaller and faster, his tactics of fluttering round their heads and buffeting them with his wings left them looking clumsy and had them taking evasive action from their much smaller adversary.

In 1968, I hand-reared a Rook *Corvus frugilegus* that consorted with the pigeons through the summer before reverting to the wild. The Rook used to chase the pigeons, trying to tweak their tails as they flew. This appeared to

be in play, with no aggressive intent. Early attempts to do the same with the Turtle Dove hybrid left the Rook out-manoeuvred by the more agile and faster dove. The original female Barbary Dove died in 1971, apparently from a fit, and was replaced by another, which proceeded to lay eggs. I had hopes of interesting colour breeding from this newly made-up pair. The fawn-coloured Barbary Dove is, as most members are aware, a long-domesticated blonde mutation of the African Collared Dove *S. roseogrisea*, which resembles a small Collared Dove and is similarly grey in colour. The first cross with a Turtle Dove is coloured as one would expect if the Barbary Dove parent had been grey; all the (recessive) fawn colour is lost. Pairing the hybrid back to a Barbary Dove produces what are effectively grey Barbary Doves, with no trace of Turtle Dove in their appearance. My pair produced one of these from their first clutch of eggs; the other eggs were addled, which should have served as a warning. Having other breeding Barbary Doves at the time, I sold the grey youngster to a dealer with a batch of fawn ones, thinking there 'would be plenty more where that come from'. There never was another. Most of the eggs from this pair were fertile but failed to hatch; when the occasional one did, the squab did not live to leave the nest. A similar state of affairs occurred in later years when the hybrid was mated with a Collared Dove. It may be the Barbary Dove x Turtle Dove hybrids are not completely reproductively viable. Certainly a female of this cross that a friend had, paired to a male Barbary Dove, never hatched an egg. The old hybrid came to a bad end in 1975. Housed in a pheasant aviary, it was pulled through 2in (5cm) wire mesh by a cat, and fatally injured. Since then I have always tried to avoid keeping any bird where it can get its head through the wire.

My subsequent experience with Barbary Doves has been great fun. In recent years they have been bred in a variety of new colours (Goodwin (1987) and Brown (1995) both describe these newer varieties in some detail), of which I have kept red and yellow varieties, making a welcome addition to the long established fawn and the White Java Dove. The latter, once a familiar conjuror's accessory, has the relatively poor eyesight of many red-eyed animals and can take a while to orient itself in a strange situation. When I tried one of these at liberty, it fluttered straight up to a height of some 50ft (approx.15m), then dropped 'like a stone' and sat there, panting, waiting to be picked up. After this, I never let one out again. The fawn Barbary Dove can make a reasonably assertive liberty subject, as described by Speakman (1982). I have seen a bewildering variety of coloured Barbary Doves in a continental enthusiast's birdroom, caged in pairs and used for fostering Bleeding Heart Pigeons *Gallicolumba luzonica*, also caged in pairs. I have never liked to keep such large birds permanently caged, but have had them so housed for months at a time, when used for fostering. Many of the

continental birds were silky feathered, like the popular poultry breed of that name; pretty, but effectively incapable of flight with their non-webbed primaries, and therefore perhaps better suited to small indoor enclosures than their flying relatives.

In addition to many European and Madagascar Turtle Doves *S. picturata*, my Barbary Doves of various colours have also fostered Senegal Doves *S. senegalensis* and the considerably larger domestic Archangel pigeons. Attempts to get them to rear Dwarf Turtle Doves *S. tranquebarica* always resulted in dead young soon after hatching, although Brown (1995) and Kendall (1973) both say it can be done.

From Barbary Doves, there was a natural progression to other *Streptopelia* species. Collared Doves proved phlegmatic and not very interesting aviary subjects, given that they are readily observed at liberty. The nearest I got was hybrid young that failed to survive, as described earlier. During our first winter here, 1984-1985, up to 30 wild Collared Doves would assemble every afternoon to feed with the waterfowl. In recent years the number has dwindled, and it is now unusual to see more than two together at any time of the year. One or two pairs of Wood Pigeons *C. palumbus* breed in the garden every year, but are never seen to feed on wheat or poultry pellets, although they eat clover from the lawn a short distance away. It seems they may have to learn that these items are edible. Stock Doves *C. oenas* and Turtle Doves have no such inhibitions. Two individuals of each (single birds months or years apart) have been seen avidly scavenging wheat and pellets from those provided for the waterfowl, or spilt along the front of a range of aviaries.

European Turtle Doves have been kept since 1971, and bred repeatedly. My original hand-reared female 'went light' and died at the age of 14 in 1985, but I still have her 1984 daughter, paired to a wild caught male imported under licence and inherited by me from a research laboratory. She refused to rear her own young (after a promising start), and for many years they were reared by Barbary Dove foster parents. However, in 1999 she and her mate reared two without assistance. During the 2000 season all of my doves, including a second pair of Turtle Doves, were together in a 70ft (approx.21m) flight. The second pair is made up of the old pair's 1993 daughter and her unrelated mate. Eggs were laid, apparently by the old female, but there was no sustained attempt to incubate these. Work commitments currently preclude me taking the time to maintain foster parents. My 16-year-old bird is not necessarily 'past it'. Her father, a non-flying wild casualty given to me as an adult bird in September 1981, accidentally drowned when at least 19 or more years of age. Writing in 1936, C. H. Macklin referred to a Turtle Dove in his possession being in robust health at 30 years of age. These are the most liable of all doves to night fright and subsequent injury, and benefit from a solid roofed aviary which effectively prevents this happening. It

does not, as might be thought, prevent them from rain bathing; they soon learn to go to the front of the enclosure during a shower of rain, and also welcome the fine spray from a garden hose.

A friend purchased a pair of Dwarf Turtle Doves in 1987. The following year the pair produced a large number of clear eggs, and the pair was eventually passed to me. Not being a viable breeding pair, I was therefore delighted to obtain a group of Dwarf Turtle Doves from Dr Brian Kendall, who had bred them for many years and was 'retiring' from birdkeeping. Combining the two inbred groups resulted in many young being produced over a period of years. However, the situation has now reached stalemate and I need to do something about it. I now have four *S. tranquebarica*, a pair which nest at one end of my big aviary, and two females paired together which lay four-egg clutches at the other end. Unfortunately the female of the pair does not lay and the other two females' eggs are infertile. There was an exception in the case of the latter, when they hatched and lost a single youngster, so there must have been some relationship with the male.

Senegal Doves (also known as Palm or Laughing Doves) proved easy and delightful. In smaller aviaries (of 20sq ft (approx. 1.8sq m) of ground space) they were intolerant of other dove species and even their own independent young. In enclosures of 100sq ft (approx. 9.2sq m) upwards, there was minimal friction with other species, and fledged young were tolerated in increasing numbers until the end of the season. They seem to do well as colony subjects in really large enclosures. Very vocal, their continuously uttered laughing call is evocative of time spent abroad, and never grates on the ears like the more strident tones of some other species. Free-breeding, long-lived, hardy and pretty, Senegal Doves have all the features of the perfect avicultural subject. A range of mutations have been established in South Africa (Cummings (1984) referred to pied, black-eyed white, cinnamon and albino mutations) but the only one I have come across in the UK is a blonde form, which bears the same relationship to the original as the fawn Barbary Dove does to its grey wild progenitor. I believe one or two people may be breeding them, but the two examples I had seemed completely sexless and showed no reproductive behaviour. A friend who over the years bred several from a colony of normal birds maintained that his blonde ones would not breed and his were all produced by normal birds. Obviously the South Africans do not have this problem.

My experiences with the large and aggressive Madagascar Turtle Dove, my most recent *Streptopelia* species, were described recently in the *Avicultural Magazine* 106, 3:107-110. I cannot see this species becoming established in the UK. It is hard enough to persuade people to keep doves without them having the 'difficult' personalities I have found among birds of this species.

Visiting London Zoo in 1972, I called in at the long established Palmer's Pet Stores nearby, still trading under a different name and management. There I found three small doves in a cage and negotiated their purchase, paying £5 (approx. US\$7.50) for the lot. Slightly larger than a Diamond Dove *Geopelia cuneata*, plumper in outline, with comparatively shorter tails, all were mainly sooty black, with grossly elongated and decurved beaks, and toenails likewise overgrown and curved. The vendor had no idea what they were. I clipped their beaks and claws back to a more normal shape and size, and turned the three out in a small outdoor aviary. There under the influence of a natural daylight regime, with access to soil and sunlight, with presumably more appropriate food and grit than in the shop, all moulted out within a few months to reveal their true identities. Two were male Ruddy Ground Doves *Columbina talpacoti* and the other a Bare-eyed Ground Dove *Metriopelia ceciliae*. The latter paired up with one of the male Ruddy Ground Doves and laid four clutches of two eggs each in a shallow wooden nest-box high up in the aviary. All proved to be infertile, demonstrating perhaps that these two South American species are not as closely related as one might think. Unfortunately the Bare-eyed Ground Dove died the following winter. No artificial heat was provided at the time and with the benefit of hindsight, it may be that this species is not entirely cold hardy. The 1974 breeding season saw me with a true pair of Ruddy Ground Doves. One of the males had died and I had purchased a female to pair up with the remaining male. These were released in an aviary 13ft (approx. 3.9m) long, completely enclosed with polythene sheeting and shared with a pair of Ceylon Junglefowl *Gallus lafayettei* and a few small passerines. Early nests of eggs were lost as the result of the male driving the female to nest again, on one occasion scalping her severely, and he was removed at the first sign of such behaviour (when the young were 12 days old) for what proved to be the last two nests of the season. As a result one and two young respectively were reared. These were sold with their parents at the end of the season, as I was going away to college and was able to leave only a few birds for my parents to look after. The darkening of the plumage of the three original ground doves seems analogous to the 'cage melanism' seen in some seed-eating passerines. I have encountered it in Lavender Waxbills *Estrilda caerulescens*, Cut-throats *Amadina fasciata* and Red Avadavats *Amandava amandava*. This apparent metabolic disturbance seems to result from a combination of incorrect diet, restricted mineral intake and lack of sunlight. Certainly correction of these three factors reversed it in my birds. I have also seen it in a much milder form in the Namaqua Dove *Oena capensis*.

My principle experience with *Columba* species was with the Stock Dove. In the days when this was legal (before the Wildlife and Countryside Act), I had two wild caught females, taken as adults from their nests in the same

hollow tree in 1970 and 1971 respectively. Eggs were taken on both occasions and entrusted to domestic pigeons. The first lot came to nothing, while the 1971 pair hatched and the squabs almost reached the point of being ready to leave the nest. At this stage they were found dead, fully feathered and with full crops. I was unable to obtain a male for the two adult females, and lost them both in 1972 from a heavy infestation roundworms, which I suspect had also caused the death of the young the previous year. These two adults had settled quickly to aviary life, accepting my presence in the aviary and spending much time feeding and sunbathing at ground level. Neither showed any interest in male domestic pigeons or the single Turtle Dove that courted one of them assiduously. The Stock Dove can be kept and bred successfully, as evidenced by Goodwin (1980) and by London Zoo's successful rearing of this species in 1867 (Sclater, 1879). Were I ever to try again, regular worming would be a priority.

I have on several occasions hand-reared starving Wood Pigeons, but, with wild ones always on view, have never found aviary space for an adult pair. My single birds have usually been released when independent. I would echo Goodwin's (1955) observation that wild Wood Pigeon fledglings when left to learn to feed themselves, often seem to become weak from lack of food, because they do not seem to receive the parental support that other species give their young at this stage.

Two male Speckled Pigeons *C. guinea* initially appeared to thrive, but were lost as the result of competition from my flock of young Madagascar Turtle Doves. I would like to try this large and very handsome African species again under better conditions.

In the early stages I learned valuable husbandry lessons from keeping domestic pigeons. Particularly useful was learning about their craving for smaller seeds than usual when feeding young, and for a variety of grit, sand and proprietary minerals at all times.

Diamond Doves were kept from 1974 for more than 20 years. Over this period two changes seemed to occur. In the early stages it was necessary to remove the young as soon as they could feed themselves, because of fear of persecution by their parents. In recent years the species seems to have become much more tolerant, breeding happily in colonies. This seems to be natural evolution, with birds that will breed under any conditions likely to leave more descendents than those that are more particular. The second change is in the ease of sexing them. My first male Diamond Doves had more pronounced eye-rings and more pronounced spotting on the wings. These distinctions seem to have become blurred in recent years, with some of the mutations, and even many normal birds, being quite difficult to sex with any degree of accuracy.

The closely related Zebra Dove *G. striata* bred for two seasons in a large aviary with Dwarf Turtle Doves (as well as a variety of non-dove species). They seemed to subtly dominate the Dwarf Turtle Doves over nest sites, although no overt aggression towards these rather larger birds was noted. No discomfort was seen in cold weather, so they were allowed to remain outside through both winters. There was of course an unheated shed and thick shrubbery available for roosting.

I kept Namaqua Doves for a couple of years before parting with them. Both with me and with friends who have repeatedly bred them, they seemed happy only during very hot, sunny weather, and I seriously question their suitability for outdoor life in this country. Their butterfly-like flight is most attractive, and I have seen them doing very well in tropical house conditions. Black-billed Wood Doves *Turtur abyssinicus* were another failure. A group of four obtained from a very successful breeder dwindled to nothing over a period of three years during which they made no attempt to breed. It may be that their requirements resemble those of the Namaqua Dove.

Green-winged Doves *Chalcophaps indica* were kept for several years in the early 1970s, but never bred due to the dominating nature of the only female, which would not let a male near her. A friend subsequently bred from my male and a more accommodating female. The observations of a friend who currently breeds them, suggest they need many months before they feel sufficiently confident in a new location. I currently have three males of that stock, which keep together as a group in their large enclosure, showing definite 'flock' behaviour, and appear much steadier and less liable to panic than when housed in small aviaries. Apart from being slow breeders, they are with their iridescent green wings and red beaks, one of the most attractive and eye-catching of the seed-eating pigeons.

Common Bronzewings *Phaps chalcoptera* are another colourful species, calm and confident by nature, and utterly trustworthy with other birds. My pair will come to my feet for broken peanuts, competing successfully with Peafowl *Pavo cristatus* and Carolina Wood Ducks *Aix sponsa* for this treat. The male was born in 1992, and reared young for a couple of seasons with his mate of the same age. A replacement female has done no more than lay the occasional egg. Butler (1911) referred to a female still living at 11½ years of age, so my pair still has time to get going. Even in a 70ft (approx.21m) flight, and apparently well paired, the sexes seem to take turns to drive each other about in between nesting attempts.

Apart from roundworms, the only disease encountered has been that of 'going light', apparently a form of trichomoniasis. These have been cured by using the appropriate drugs for domestic pigeons similarly affected. The new probiotics are a great help in restoring sick birds to robust health. Limited success was experienced with salt water as used by Speakman (1982).

Of the 17 species kept, eight have successfully reared their own young: Barbary, Dwarf Turtle, European Turtle, Senegal, Diamond, Zebra, Common Bronzewing and Ruddy Ground Dove. Madagascar Turtle Dove were reared by foster parents only, while Collared were hatched but not reared. Infertile eggs were laid by a Bare-eyed Ground Dove, while Black-billed, Namaqua and Green-winged Dove made no attempt to nest. Wood Pigeon, Stock Dove and Speckled Pigeon were not kept as pairs. I have twice had two females of a species pairing up in the absence of a male, and rearing young from fostered eggs. Thus two Collared Doves reared a Turtle Dove, and Dwarf Turtle Doves reared two of their own species.

Optimum breeding results have been obtained in small aviaries up to 10ft (approx.3m) in length, with a single pair of doves and nothing else. Housing several species together in a 70ft x 15ft (approx. 21m x 4.5m) aviary is labour saving, but produces negligible breeding results due to interspecific competition. Ideally aviaries should have solid roofs to prevent night frights, but this is less practical in larger enclosures. Wild avian predators can cause distress and harm to doves in aviaries. I found a group of Black-billed Wood Doves, Dwarf and European Turtle Doves, sharing the same aviary for the winter, hiding motionless among the ivy that covered the floor. My initial reaction had been that they had all escaped somehow, but while I was in the aviary investigating, a male Sparrowhawk *Accipiter nisus* came and sat on the wire just above my head, flying off reluctantly only when poked with a stick. It was as if it did not register my presence, so focussed was it on the doves in the aviary. Birds in an aviary must appear to a hunting Sparrowhawk like birds in thick shrubbery that can be flushed out into the open. Having frightened the hawk off, I located all the traumatised doves and gently placed them on the perches. All sat there for many minutes before returning to normal activity. The next day, however, one of the Black-billed Wood Doves was dead, apparently from delayed shock. Tawny Owls *Strix aluco* will harass birds in aviaries in a similar manner; one came very close when I was in with a group of Dwarf Turtle Doves at dusk. Their nocturnal raids can lead to scalped heads and grazed wings. This is where a solid roof can be a great help.

Birds of other orders usually ignore doves housed with them, although much depends on the individual circumstances and disposition of the birds. I have heard of a territorial male Grey Peacock Pheasant *Polyplectron bicalcaratum* killing newly fledged Bronzewing Doves, but I have bred the two species in the same enclosure without incident. Cheer Pheasants *Catreus wallichii* rearing chicks killed a Wood Pigeon with no prior warning. Parrots have been the worst offenders with me, undoubtedly from the initial fear of large-winged relatively clumsy newcomers flapping about near them. Indian Ring-necked Parrakeets *Psittacula krameri*, perfectly amicable with similarly

sized laughing thrushes *Garrulax* spp., inflicted such a severe bite to the leg of a European Turtle Dove that I decided they should not share a 30ft (approx.9m) flight. Cockatiels *Leptolophus hollandicus* threatened to do the same to Barbary Doves. The Turtle Dove's injury eventually mended and I persevered with the Cockatiels and later had these and various doves breeding happily in the same enclosure. Different doves species will usually co-exist, so long as they are not too similar in appearance, and have enough room.

My doves have always shown a preference for the relatively oily seeds such as hemp and safflower, but appear to balance the diet when enough choice is given. I have always provided a pigeon trapping mixture (intended to entice racing pigeons into the loft after a race) and a foreign finch mixture, with the proportions adjusted to suit the size of the birds. Poultry pellets and whole wheat are usually on offer and, occasionally cracked maize, for pheasants and ducks sharing the aviary, and the doves eat what they fancy of these. Most doves will relish broken peanuts when they have learned that these are edible. Pigeon peas and beans are appropriate only in small quantities for the larger *Columba* species. Small amounts of greenfood (chopped, securely anchored or growing) are taken along with proprietary softfood when they are rearing young. All species relish fresh (not soaked) wholemeal bread, especially when rearing young. Poultry chick crumbs are also taken and boost the protein intake. Grit is very important. I use fine oystershell, flint of varying sizes, sand and above all the powdered minerals sold for domestic pigeons. The last named are eagerly taken by all the doves I have kept, as well as by finches.

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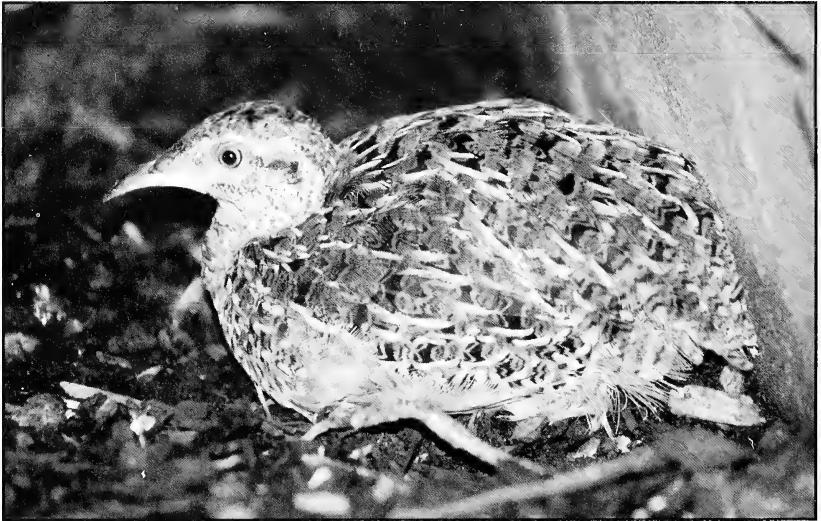
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THE ANDEAN TINAMOU *Nothoprocta pentlandii* IN CAPTIVITY

by Chris Smith

Natural History

Tinamous (Tinamidae) are a family of ground-dwelling birds that appear to be similar to pheasants and quail (Phasianidae), but are actually more closely related to rheas (Rheidae), ostriches (Struthionidae) and emus (Dromaiidae). While tinamous and ratites share similar skeletal and muscular structures and physiological traits, tinamous are distinct from the flightless ratites in that they possess a keeled sternum and fully developed wings. Despite the tinamous' ability to fly, some taxonomists classify tinamous in the same order (Struthioniformes) as rheas, ostriches and emus.



Chris Smith

Adult Andean Tinamou

Tinamous can be found in a wide variety of habitats in Central and South America. These birds are generally lacklustre in appearance, with the plumage coloured various shades of brown and grey, patterned with streaks, bars or vermiculations. Many species are noted for their loud high-pitched calls. The colour of the eggs is perhaps one of the family's most distinguishing characteristics. Tinamou eggs are usually brightly coloured and have a highly glossed surface. Egg colour, which varies from species to species, includes various shades of green, blue, purple, brown and yellow.

Tinamous are both polygamous and polyandrous. Males will breed with

several females, all of which will lay their eggs in a communal nest. Once a female has laid a clutch in one male's nest, she will then go off and mate with another male in an adjacent territory. Each male is responsible for incubating the eggs and rearing the young, females do not participate in this.

The Andean Tinamou is light brown to greyish brown, with dark markings and light streaking on the upperparts (see photo preceding page). The short dark brown to black feathers on the crown can be erected when the bird is excited. The underparts are lighter and become buffy on the flanks and belly. This species measures 25cm-30cm (approx. 9 3/4in-11 3/4in) in length and weighs 250g-350g. Males and females are similar in appearance, with females tending to be slightly heavier.

The Andean Tinamou is found on temperate semi-arid slopes and in valleys in the Andes Mountains at elevations between 1,500m-4,000m (approx. 5,000ft-13,000ft). It ranges from western Peru and Bolivia to northern Chile and north-western Argentina. Its preferred habitat is shrub and brush land. Other habitat includes forest edges and open woodlands. These birds are reportedly common visitors to potato and alfalfa crop fields. The Andean Tinamou is considered to be common throughout its range and currently there are no immediate threats to its survival. Its preferred habitat of high and often inaccessible terrain seems to be a deterrent to human encroachment and development. Farming that does occur within the tinamous' range is limited to small-scale operations due to the ruggedness of the landscape.

The family Tinamidae contains 47 species. Despite a fairly diverse selection of these birds and their tolerance of a wide range of weather conditions, only eight species were displayed in zoological institutions at the time of the publication of the 1999 *International Species Information System Abstract Report*. Approximately half of these captive birds were of one species, the Elegant-crested Tinamou *Eudromia elegans*, while the Chilean Tinamou *N. perdicaria* accounted for over 20% of the captive tinamou population. The remaining population comprised of six species, with no more than a dozen (12) specimens of any one of these species. The Andean Tinamou can be seen in only two zoological collections: Cincinnati Zoo and Oklahoma City Zoological Park.

Husbandry

Oklahoma City Zoological Park has exhibited the Andean Tinamou since 1995. All the birds were wild caught. They have been displayed in a variety of enclosures, both indoors and outdoors. This species' tolerance of extreme temperatures has enabled it to be exhibited in outdoor aviaries throughout the year. Our Andean Tinamous have lived peacefully with a variety of

other bird species, including small pheasants, ground doves and shorebirds.

All the enclosures that have housed Andean Tinamous have shared several characteristics, such as grasses, shrubs or tropical plants for the birds to hide beneath and cypress mulch or pine bark mulch as a substrate. Like pheasants, tinamous spend a great deal of time digging in soil or mulch searching for food and can be quite destructive in a well-landscaped exhibit. Unlike most pheasants, however, tinamous use their beaks rather than their feet for turning soil and mulch.

The diet offered to the tinamous is very similar to that which is offered to most ground-dwelling birds, namely Purina Gamebird Chow, hen scratch, parrakeet and finch seed, blended fruit and vegetable mix (apples, oranges, carrots, green peppers, celery, raisins and sweet potatoes), corn kernels, shredded spinach and chopped hard-boiled egg. Crickets, waxworms and mealworms are also offered. Insects appear to be the tinamous' favourite food. Some birds readily greet caretakers at the exhibit entrance when insects are being distributed. Two supplements are added to the diet: Vionate, general vitamin powder and Osteoform, calcium supplement.

Although tinamous may be shy and secretive when first introduced into a new enclosure, once they have settled in their new surroundings, they can make interesting exhibits. Tinamous spend a great deal of the day searching and digging for items of food. During the breeding season, which in captivity can last from spring through autumn, these birds often indulge in courtship activities. The most obvious of these is the vocalization, which can be described as a loud high-pitched 'pwee-weet', usually repeated many times throughout the day. What appeared to be a courtship dance has also been observed. One bird, the male presumably, would circle another, bobbing its head while emitting a soft mellow 'pweet-weet'. Another aspect of the courtship behaviour involved a male sitting on its haunches, bobbing its head, while facing towards a female with his hind feathers erect and wings partially spread. This display was reminiscent of the courtship of the Ostrich *Struthio camelus* and rheas *Rhea* and *Pterocnemia* spp., but not as elaborate.

Captive propagation

In the autumn of 1997 the Andean Tinamous at Oklahoma City Zoological Park began producing eggs. Those of the Andean Tinamou are a chocolate brown with a purple sheen and have a glossy enamel sheen (see photo p. 65). As the eggs age, they fade and lose their purple sheen. Measurements of 18 eggs sampled ranged from 51mm x 34mm to 56mm x 36mm, with the average being 53mm x 35mm. Weights recorded of pre-incubated eggs ranged from 32.9g-38.3g, with the average from 30 samples being 35.7g.

The first time breeding was attempted, there were five adults in the same enclosure. Eggs were found two or three days apart, and were at different



Andean Tinamou eggs

Chris Smith



Chick about one week old

Chris Smith

locations in the exhibit. Eight eggs were collected and artificially incubated. All were infertile. In the spring of 1998 two eggs were found and were removed for artificial incubation. One of these was fertile and after 21 days incubation at 37.5°C (99.5°F) and humidity near 50%, the chick hatched unassisted.

In the autumn of 1998 the tinamous began laying again and produced 18 eggs. From these, eight chicks were hatched successfully. The eggs were incubated under the same conditions as the previous eggs, but this clutch showed a wider variation in incubation times than was expected. The normal incubation time for the Andean Tinamou ranges from 20-22 days. The incubation time for this clutch ranged from 21-28 days.

After hatching, chicks were left in the incubator for approximately 24 hours in order to dry and absorb their yolk sacs. Afterwards, they were moved to a brooder box. The brooder box used measured roughly 2.5m x 1m (approx. 8ft 3in x 3ft 3in). Heat lamps hung above the boxes provided warmth for the chicks. The temperature in the brooder box was initially kept near 30°C (86°F). The bottom of the box was covered with outdoor carpet laid over sections of landscaping mats. These helped to keep the carpet dry and provided a softer surface for the chicks to walk on. Screened lids were found to be essential as tinamou chicks are capable of jumping or even flying out of the boxes. The brooder box was divided in half by a panel with small shift doors. By shifting the chicks to one side of the box, the shift doors could be closed, allowing caretakers to clean the brooder box without having tinamous jump out. Throughout the brooder box, small cardboard boxes with multiple openings were used to provide the chicks with hiding places. Small slats of cardboard were placed along the walls, essentially acting as tunnels from one hide box to another.

The diet offered to the young tinamous was basically the same as that fed to the adults, except that Purina Gamebird Chow was replaced with Purina Start and Grow, and the fruit and vegetable mixture and spinach were more finely chopped. Chicks have shown a strong preference for hard-boiled egg, but should be offered only a small amount of this, and encouraged to eat a more balanced diet. Chicks that were allowed to eat larger amounts of hard-boiled egg tended to develop 'airplane wing'. Insects are also a favourite food item of young tinamous.

In the summer of 2000, some of the chicks hatched in 1998, after being placed in a breeding group of older birds, began producing eggs. Over 20 eggs were collected from the birds, from which nine chicks hatched. Throughout the year the tinamous continued to produce eggs. However, with the brooder facilities well stocked with hatchlings, we eventually stopped removing eggs from the exhibit.

The male began to incubate after six eggs had been deposited in the nest, which was little more than a bare patch of ground. Two more eggs were

added to the nest after the male had begun sitting. After approximately 22 days, two chicks hatched. Before the chicks hatched, the other birds in the exhibit were relocated to another enclosure. These birds had apparently been plucking feathers from the male tinamou's head while he was incubating the eggs, and with the chicks due to hatch soon, we wanted to prevent him being harassed by these other birds.

During the first week, the chicks remained close to their father. The chicks appeared to be very calm in the enclosure, despite the close proximity of zoo visitors. When the male felt the chicks were threatened, he would emit a low mournful call, and the chicks would join him. Over the next few weeks the chicks gradually became more independent. After the chicks were about a month old the male frequently gave mating calls. The female and other adults that had been removed from the enclosure housing the chicks were out of visual range, but were able to hear and respond to the male's calls.

The hatchings that occurred in 1998 are believed to be the first captive breeding of the Andean Tinamou, at least in a zoological setting. At that time, Oklahoma City Zoological Park was the only zoo with Andean Tinamous in its collection. The chicks hatched in 2000 represent the first second-generation breeding and the first captive parent-reared chicks.

Summary

The Andean Tinamou *Nothoprocta pentlandii* has been exhibited at the Oklahoma City Zoological Park since 1995. These birds have been found to be undemanding to care for and tolerant of a wide variety of habitats and temperatures. The Andean Tinamou was bred first at Oklahoma City Zoo in 1998, which is believed to be the first breeding in captivity. In addition, a captive-bred second generation was hatched in the summer of 2000, and included the first parent-reared chicks in captivity.

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Products mentioned in the text

Purina Gamebird Chow: manufactured by Purina Mills Inc., St Louis, Missouri, USA.

Purina Start and Grow: manufactured by Purina Mills Inc., St Louis, Missouri, USA.

Osteoform Calcium-Phosphorus and Vitamin Powder Supplement: manufactured by Vet-A-Mix, Shenandoah, Iowa, USA.

Vionate Mineral Powder: manufactured by Gimborn U.S., Atlanta, Georgia, USA.

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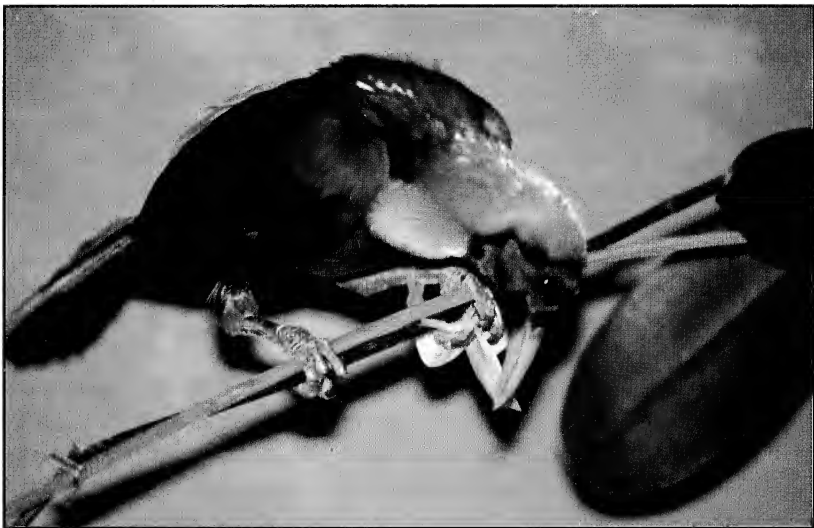
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CHESTER ZOO BIRD REVIEW 2000

by Roger Wilkinson

The high point of 2000 for me was watching the pair of Red Birds of Paradise *Paradisea rubra* in the new Islands in Danger exhibit. These two birds, which we received in 1999 from the Bronx Zoo, really enjoy the natural jungle planting of their new spacious enclosure and took great delight in dismantling petal by petal the delicate orchid flowers previously gracing this exhibit. Still in immature plumage the male has nevertheless begun displaying and calling at his chosen display site.



R. Wilkinson

Immature male Red Bird of Paradise

The two White-eared Catbirds *Ailuroedus buccoides*, which we received in 1999 from Stuttgart Zoo, also settled down quickly in their adjacent enclosure in the New Guinea area of Islands in Danger. One of the catbirds built a nest then laid and incubated two eggs but as both birds are females and a male cannot be found this was clearly fruitless. A third very large community aviary in this New Guinea section of the exhibit is home to a Blue Crowned Pigeon *Goura cristata*, two home-bred Golden Heart Pigeons *Gallicolumba rufigula*, three White-collared Kingfishers *Halcyon chloris* bred at and received from Antwerp Zoo, two Hooded Pittas *Pitta sordida* bred at Burger's Bush, Arnhem, Stella's Lorikeets *Charmosyna papou*, a family of Duyvenbode's Lories *Chalcopsitta duivenbodei* and a

Musschenbroek's Lorikeet *Neopsittacus musschenbrokeii*. During the summer a pair of Stella's Lorikeets nested and successfully reared a chick in this aviary. Mixed species exhibits are always dependent not only on careful management but also on the compatibility of individual birds whose behaviour may be unpredictable. The Stella's Lorikeets used only one nest but excluded the White-collared Kingfishers from all three hole-nests. The three Duyvenbode's Lories, a pair and their chick of 1999, were introduced to the aviary later in the year and initially appeared compatible with the other lorikeets. However this peace did not last and even in this very large aviary we would not now wish to mix the larger, and as they proved, more aggressive Duyvenbode's Lories with the Stella's Lorikeets. The Duyvenbode's Lories have since been removed from the aviary and the Stella's returned to this enclosure.

A fourth large and again very well planted enclosure is home to a magnificent pair of St Lucia Parrots *Amazona versicolor* received from the Durrell Wildlife Conservation Trust, Jersey Zoo, and through it on loan to us from the St Lucia Government. These parrots have settled well and to the surprise of many people have hardly damaged the lush planting in their aviary. Watching them in late December I was thrilled to see the female entering the nest after calling and displaying to her partner with wings and tail outstretched showing off the red highlights on the upper wing and the striking banding pattern of the spread tail.

The range of aviaries close to Islands in Danger, now has a limited lifespan in that this area is likely to be the site for redevelopment for more island species. These aviaries hold some interesting and important stock including the threatened Blyth's Tragopan *Tragopan blythii*, Malay Crestless Firebacks *Lophura erythrophthalma erythrophthalma*, Edwards' Pheasants *L. edwardsii* and Vietnamese Pheasants *L. hatinhensis*. We had our first eggs from the Vietnamese Pheasants in 2000. These were artificially incubated and although one chick hatched this sadly failed to survive. Birds successfully reared from stock in these aviaries included a Pink Pigeon *Columba mayeri* (this was foster reared by White Java Doves *Streptopelia risoria* dom.), Mountain Witch Dove *Geotrygon versicolor*, Violet Plantain Eaters *Musophaga violacea*, Tawny Frogmouth *Podargus strigoides*, Lilac-breasted Roller *Coracias caudata*, Azure-winged Magpies *Cyanopica cyanea* and a Red-billed Blue Magpie *Urocissa erythrorhyncha*.

The Great Grey Owls *Strix nebulosa* laid and incubated but then deserted their eggs on the point of hatching. One Spectacled Owl *Pulsatrix perspicillata* and two Barn Owls *Tyto alba* were also reared. With a change of emphasis in local Barn Owl conservation towards habitat research and nest-box schemes, the release scheme for Barn Owls, co-ordinated by Carole and Paul Hackney of Keele University, has recently dropped down a couple

of gears and only a few birds are now released each year. We had intended to hold Barn Owls only as non-breeding display birds and to design interpretative signs and use these birds to promote local conservation awareness for the Barn Owl through the Action Plan co-ordinated by the Cheshire Wildlife Trust. As such we received a tame imprinted male Barn Owl that we were told would not be interested in our female and would remain on show in the aviary rather than retire to the roost/nest-box preferred by the female owl. His behaviour changed on arrival at Chester and he not only retired to the roost box but the charms of our female proved too much for him resulting in him fathering two unexpected chicks.

The Black-necked Swans *Cygnus melanocoryphus* reared two cygnets on the penguin pool and Red-crested Pochard *Netta rufina* reared their own young in Europe on the Edge - our large enclosure for European birds. Eggs from other waterfowl and pheasants were transferred to the incubation and rearing area where successes included the rearing of Ross's Snow Goose *Anser rossicus*, Hawaiian Goose *Branta sandvicensis*, Mandarin Ducks *Aix galericulata*, Northern Shoveler *Anas clypeata*, Laysan Teal *A. laysanensis*, Ferruginous Ducks *Aythya nyroca*, Marbled Teal *Marmaronetta angustirostris*, White-headed Ducks *Oxyura leucocephala*, Green Peafowl *Pavo muticus* and Mountain Peacock Pheasants *Polyplectron inopinatum*.

A pair of Satyr Tragopans *T. satyra* again reared their own chick. Several Roulroul Partridge *Rollulus roulroul* were artificially reared and chicks were also reared by their parents in one of the Tropical Realm aviaries. Also in the Tropical Realm it was a delight to watch the Congo Peafowl *Afropavo congensis* rear two broods of chicks. As noted in previous years, the two first brood chicks assisted in caring for the chick of the second brood. Other successful breedings in the Tropical Realm aviaries included a Lilac-breasted Roller, a Nicobar Pigeon *Caloenas nicobarica*, four Bali Starlings *Leucopsar rothschildii* and 10 White-rumped Shamans *Copsychus malabaricus*. Four of these White-rumped Shamans were donated to Jersey Zoo, two to Paignton Zoo and four to private aviculturists keen to work with these birds. Birds fledged in the free-flight area included 16 Speckled Pigeons *Columba guinea*, a Red-whiskered Bulbul *Pycnonotus jocosus*, two Red-billed Leiothrix *Leiothrix lutea*, seven Yellow-throated Laughing Thrushes *Garrulax galbanus*, two Omei Shan Liocichlas *Liocichla omeiensis*, five Asian Glossy Starlings *Aplonis panayensis*, four Grosbeak Starlings *Scissirostrum dubium* and an Emerald Starling *Lamprotornis iris*. It was especially gratifying to breed the Omei Shan Liocichlas. Although Omei Shan Liocichlas have been previously bred by several private aviculturists, including the species co-ordinator Nigel Hewston, it is thought that Chester may be the first zoo to have success with this species.

Parrots bred in the collection included two Blue-eyed Cockatoos *Cacatua*



R. Wilkinson

White-eared Catbird

ophthalmica, a Yellow-collared Macaw *Ara auricollis*, a Blue-winged Macaw *A. maracana*, a Golden-capped Conure *Aratinga auricapilla*, four Greater Vasa Parrots *Coracopsis vasa*, two Slender-billed Conures *Enicognathus leptorhynchus* and a Derbyan Parrakeet *Psittacula derbiana*. Two Thick-billed Parrots *Rhynchopsitta pachyrhyncha* were hatched but died at just over a month old.

Growth measurements of the Greater Vasa chicks were taken by our parrot staff to chart their rapid development as a contribution towards Sheffield University PhD student Jonathan Ekstrom's sociobiological studies



R. Wilkinson

St Lucia Amazon

of these parrots in Madagascar. The Blue-eyed Cockatoos were hand-reared by Anne and Paul Morris who for many years have made a very significant contribution to our conservation breeding programmes. We were then especially pleased to be able to send Anne Morris to Mauritius for a four month period to assist Carl Jones's team with the hand-rearing and subsequent

release of chicks from wild nests of the critically endangered Echo Parrakeet *Psittacula echo*. As well as the secondment of Anne, this work was further assisted by Chester Zoo's provision of additional funding to cover the costs of the international hand-rearing component of this important conservation programme.

Both of our pairs of Great Hornbills *Buceros bicornis* nested in 2000; with both females spending lengthy periods in the nest. Mating of the Great Hornbill pair held in the aviary in the Elephant House was observed on January 8th and 12th. The female was recorded as being continuously in her nest by February 3rd with mudding of the nest hole continuing after this time. Following her emergence from the nest on April 3rd inspection of the vacated nesting trunk revealed egg-shell fragments. The pair of Great Hornbills in the Tropical Realm were a little later nesting with the female mudded-up in early March. She also emerged in early June after an unsuccessful nesting attempt. Checking her nest-box revealed an unhatched egg which although fertile had failed during early incubation. In order to be able to better understand why these and other hornbills are failing to rear chicks, during the winter, we installed cameras in the nest-boxes of most of our hornbills. These are connected to an off-show TV monitor and video unit to allow further research into their nesting behaviours. In the future we hope to be able to extend this coverage to allow our visitors to see inside the nests of our hornbills and other hole nesting birds. The Wrinkled Hornbills *Aceros corrugatus*, which successfully reared chicks in 1999, again nested twice in 2000 but no chicks were hatched. The female emerged after the second nesting attempt with a fungal eye infection from which, despite immediate treatment and prolonged veterinary care, she failed to recover. Post-mortem findings revealed this infection had spread throughout her body and subsequently caused her death.

Three West African Black Crowned Cranes *Balearica pavonina pavonina* were foster-reared by bantams and one Red-crowned Crane *Grus japonensis* was successfully parent-reared. The females of our pairs of White-naped Cranes *G. vipio* and Wattled Cranes *Bugerenus carunculatus* lay eggs each year but despite appearing well bonded with their partners have, so far, only produced infertile eggs. Although artificial insemination in 2000 failed to result in fertile eggs for either species we intend to try this technique again in 2001.

Caribbean Flamingos *Phoenicopterus ruber ruber* and Chilean Flamingos *P. chilensis* both bred in 2000. Our first Caribbean Flamingo chick hatched on July 20th with five more hatched over the next 19 days. The first of 12 Chilean Flamingo chicks hatched on September 4th with hatchings continuing until October 13th. A number of these late hatched chicks succumbed in the deteriorating autumn weather and because of this the last

two chicks were hand-reared. In total five Caribbean and six Chilean Flamingos were reared successfully. Checking back on previous records at Chester; since our first breeding success in 1989 our first hatch dates for Chilean Flamingos range from July 3rd to September 1st and for Caribbean Flamingos range from June 24th to July 15th. For both species the first hatch dates in 2000 were the latest recorded and we hope this does not represent a shift to later breeding by these two colonies.

Because of our previous success with both Waldrapp Ibis *Geronticus eremita* and Humboldt's Penguins *Spheniscus humboldtii* resulting in their offspring already being well represented in the managed EEP populations we again limited the numbers bred. Although only a few of each species were bred we feel it important to not restrict breeding behaviour completely. Breeding one or two of these birds each year helps us feel more confident that we retain our abilities to increase production of young birds if and when necessary.

Much emphasis has been placed on building links between zoos and field conservation. This was especially relevant in 2000 for a number of the bird species held at Chester and for several of the bird staff. Although we currently hand-rear only a few penguin chicks we have many years of experience in hand-rearing Humboldt's Penguins at Chester. These husbandry skills were put to great use when, in the wake of the oil spill disaster in South Africa affecting the endangered African Penguins *S. demersus*, we were able to assist by sending our most experienced penguin keeper, Karen Davies, to join the international rescue team. Karen played a most important role in directing and assisting with the feeding of many thousands of rescued penguins.

Other bird conservation and research programmes, projects and organisations that received Chester Zoo's support in 2000 included Birdlife International and Fauna and Flora International through sponsorship of Philippine hornbills conservation and Wetlands International through joint funding of its Black Crowned Crane programmes. Manchester Metro University received support for research on Blue-winged Macaws in Brazil. Chester Zoo along with Leeds Castle Aviaries worked together with Roland Wirth and the Zoological Society for the Conservation of Species and Populations to provide funds for research on Yellow-throated Laughing Thrushes in China. We very much hope these links between Chester Zoo and other conservation organisations can be sustained and developed during 2001 and beyond.

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BREEDING THE VICTORIA CROWNED PIGEON *Goura victoria* AT BRISTOL ZOO GARDENS

by Nigel Simpson

Introduction

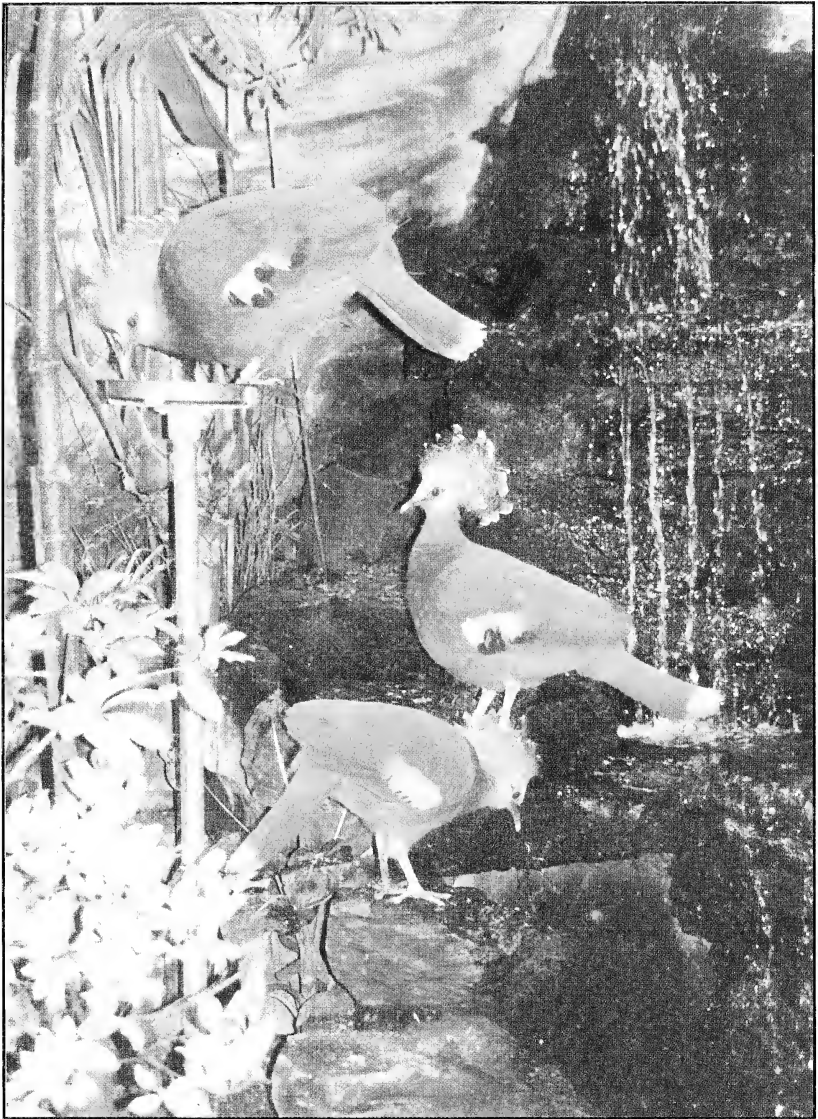
Found in New Guinea, this the largest living pigeon is probably the most striking of all the columbid species. The Victoria Crowned Pigeon *Goura victoria* is found in northern New Guinea in both Irian Jaya and Papua New Guinea. Two other species of crowned pigeon are also found in the region, these are the Southern Crowned Pigeon *G. schaefferi* and the Western Crowned Pigeon *G. cristata*.

The Victoria Crowned Pigeon differs from the other two species in having the crest feathers broadly tipped with white. The overall colour is dark bluish grey with a purplish breast area. The wing patches are grey edged with dark purple (del Hoyo et al. 1997). Listed as vulnerable in *Birds to Watch 2* (Collar et al. 1994), this species is managed in captivity by a European Endangered Species programme. The main threats in the wild are deforestation, capture for trade and hunting for food.

Although few birds are held in the UK (in three collections only) several continental collections house and breed crowned pigeons. The 1999 European Studbook report states that 36 European collections had *G. victoria* and the population was 49.57.21, with eight collections breeding it. The number bred in 1999 was 16 of which five did not survive (Nijboer, J, 2000). Crowned pigeons have been housed at Bristol for a number of years with the UK first breeding occurring here in 1972.

Our birds were captive bred in Europe and were acquired in January 1996 from Arcen in the Netherlands. Both birds were approximately six months old having been hatched in June and July of 1995. The birds were housed in several aviaries for the initial two years before being moved into the large walkthrough Wallace Aviary in May 1998. This enclosure has a large indoor area and an outdoor area, with the birds having access to both areas. During the winter months (October - April) the birds are restricted to the indoor area only. Inside the birds are housed in a tropical environment with the temperature maintained at approximately 20°C (68°F) (Fig. 1). Also obtained were a second pair that were housed in an enclosed aviary within the main indoor area. These birds had visual and vocal contact with the first pair, but no physical contact.

The aviary houses several other columbids including *Ptilinopus*, *Treron* and *Ducula* spp. All birds are fed a general omnivorous diet consisting of grain, insectivorous food, chopped fruit, boiled rice, boiled egg, soaked crushed diet A and soaked mixed dried fruit, supplemented with multi-vitamin



Daniel Shearing

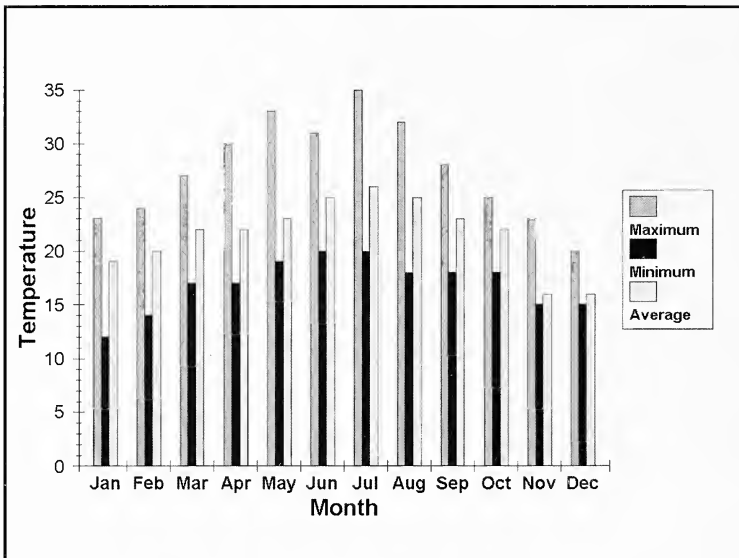
Family group of Victoria Crowned Pigeons. The immature bird (bottom) at two months old has yet to develop the white edging to its crest and the dark purple wing bars

powder. Livefood is taken when scattered around the aviary floor. Dried fruit is soaked in tea and water on alternating months.

Nesting

With an aviary height of approximately 10m (32ft) at the highest point, nesting platforms were placed as high as possible. Height was thought necessary as nests in the wild have been recorded at an average height of 8m (approx. 26ft) (Damen, 2000). Being such large birds it is recommended that they have the ability to access the nest from at least two points. This facilitates the change over of incubation and brooding adults (King et al. 1996).

Fig 1. Temperatures at nest site in inside area of aviary



Two nest platforms were erected, one on a large branch placed across an open space connected at either end to the roof beam and the internal aviary. The second platform was placed directly in the centre of one of the roof beams. Each platform was approximately 6m (20ft) off the ground. Both of the platforms were used with the second being the most successful. The nest platforms were made of 2.5cm (1in) weldmesh measuring 60cm x 60cm (almost 2ft x 2ft) and attached to the beams with large staples. Added to this platform was a 50cm x 50cm (approx. 20in x 20in) flexible plastic sheet that has 2mm ($1/12$ in) holes in it, and was purchased from a local hobby craft store. Nesting material was provided in the form of birch twigs broken off besam brushes, small twigs from any plant material and large leaves that had dropped from plants in the aviary. No nesting material was added to the platform by keeping staff, all nesting material being added by both adult birds. The nest consisted of a small amount of nesting material that the

adults meticulously arranged on the platform. This nest appeared to be very sparse in comparison to nests observed in the wild.

Incubation

The first egg was laid in January 1999, but was found broken on the floor of the aviary. A total of eight eggs was laid (Table 1) in 1999, three of which hatched. Two of the chicks were hatched in the incubator and one under a foster dove *Streptopelia risoria* dom. The foster doves failed to rear their chick and hand rearing failed in the case of the other two.

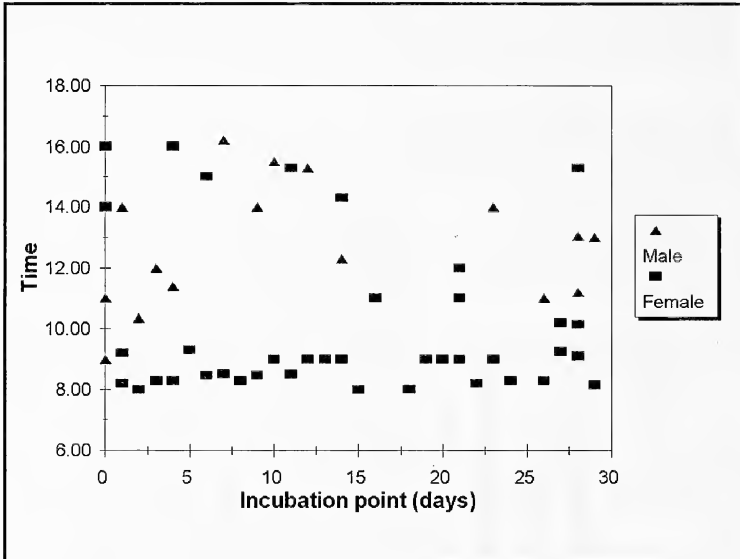
Table 1. Eggs laid in 1999 season

Egg	Date laid	Date hatched	Comments
1	12/01/99	N/A	Broken on day one.
2	05/02/99	N/A	Broken on day one.
3	28/03/99	25/04/99	Hatched after 28 days in incubator. Hand-rearing attempt failed.
4	16/04/99	N/A	Artificially incubated, but removed when found to contain early dead embryo.
5	07/05/99	06/06/99	Hatched after 29 days under foster doves, but died after five days.
6	25/05/99	N/A	Incubated by adults, but found broken after 11 days. Contained early dead embryo.
7	30/06/99	27/07/99	Hatched after 28 days and successfully reared by parents.
8	08/12/99	N/A	Adults sat full-term then discarded egg from nest. It was addled.

The reason for failure of the birds to sit on the earlier eggs is unknown, but it does appear that the birds undergo a learning process. Earlier eggs seem to be lost due to naivety about incubation and once the birds have made two or three incubation attempts they appear to sit much more consistently. (This also seems to be the case with other columbids especially *Gallinolumba* spp. (N.Simpson pers. obs.)) The third, fourth and fifth eggs were removed for artificial incubation following the loss of the first two eggs. Dummy eggs were put into the nest (with the intention of returning the real eggs), but the adults sat on these for only two to three days.

Incubation of the eggs was predominately carried out by the female, with the male taking over at mid-day for two to three hours (Fig 2). It is unknown if any change ever occurred during the night, but is thought to be unlikely.

Fig 2. Times and incubation point both male and female birds were seen to be incubating egg



Of the eight eggs assessed, 75% were fertile, two were undetermined. Of the six fertile eggs, 50% hatched, of which 33% survived, this being the single squab reared.

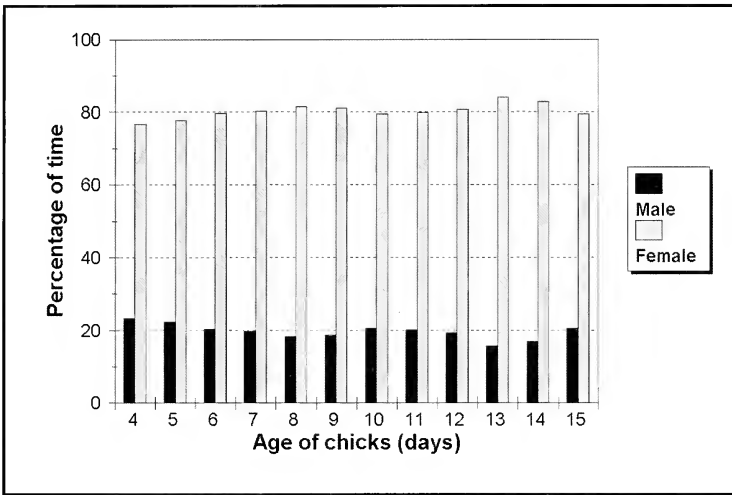
The first egg to hatch under the adults hatched on July 27th 1999 after 28 days incubation. A security camera was installed during incubation, to enable video recording of the birds and allow the public to view the nest via a monitor in the house. The first indication that the egg had hatched was the sight of the egg shell on the edge of the nesting platform. This soon dropped to the ground and inspection confirmed the egg had hatched.

Rearing

Rearing (as was incubation) was carried out by both adults, with the first observed feeding taking place in the first 24 hours. Analysis of the video footage covered the period when the chick was aged between four days and 15 days. Both adults attended the chick with the female attending the majority of the time (Fig 3), however a reversal seemed apparent after the chick had fledged. The video recorded for 24 hours including the hours of darkness. It was presumed that the female attend throughout this time and there was

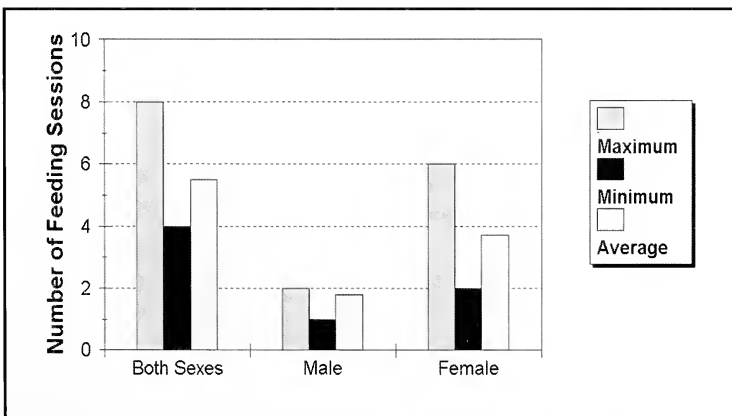
no swap over, as she was always present at the end of the day and first thing in the morning.

Fig 3. Percentage of time male and female attended chick on nest



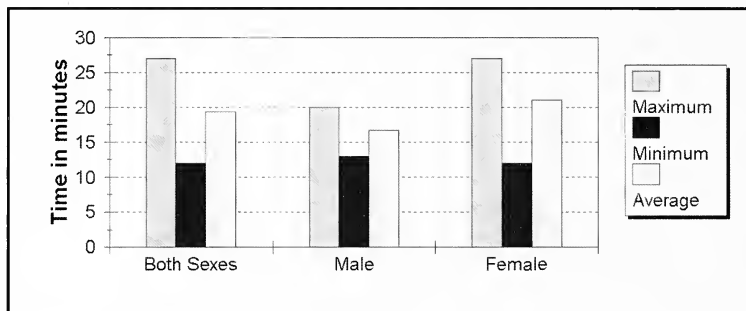
Chick feeding was by the typical pigeon method, with the adult brooding the chick whilst the chick reached into the back of the adult's throat for the food. No obvious soliciting of the adult was seen. Both the male and the female were seen to feed the chick on the nest, with the female feeding the chick on more occasions (Fig 4). Each feeding session was recorded for each sex with the maximum feeds given in one day being eight and the minimum being four. The male undertook fewer feeding sessions than the female, probably due to the shorter time the male attended the nest.

Fig 4. Number of feeding sessions per day



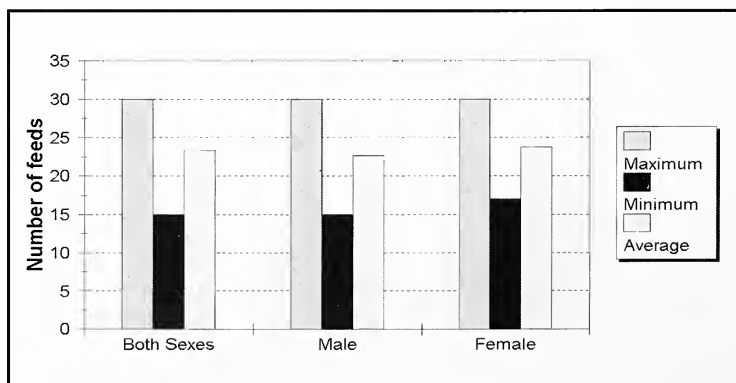
Each feeding session was timed and the length of time the adult spent feeding the chick was recorded (Fig 5). The male feeding sessions were shorter than those of the female by almost five minutes. The longest feeding session was 27 minutes and the shortest 13 minutes. The varying lengths of feeding were not regulated by time of day, with both long and short feeds occurring at different times of the day.

Fig 5. Duration of feeding sessions



During each of the feeding sessions, the actual number of times the adult fed the chick was recorded. Unlike the length of feeding sessions and the number of feeding sessions this was very similar for both male and female (Fig 6). Even though the male had shorter feeding sessions, he was still able to feed the chick a maximum of 30 feeds a session. This is the same maximum number of feeds as the female, likewise the minimum number of feeds was very similar. The reasons for this are uncertain, possibly the adult has an amount of crop milk to secrete and needs a certain number of feeds to regurgitate this to the chick. The volume of crop milk given to the chick could not be quantified, but each individual feed by both adults lasted about the same time.

Fig 6. Number of individual feeds per feeding session



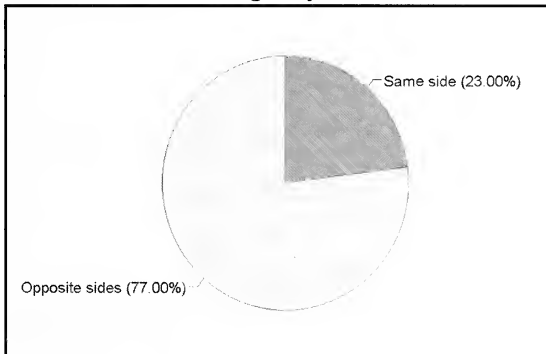
No video recordings were made after the chick was 15 days old, and it is unknown if any of the feeding changed as the chick grew older. In the first 14 days it did not appear to alter much.

As mentioned earlier, suitable perching is required to enable the adult birds to exchange parental duties at the nest. The directions the adults arrived and departed from the nest were recorded during the chick rearing period. Four sides of the nest were used to describe arrival or departure from the nest:

- Front (towards the camera, no perching).
- Back (rear of nest farthest from camera, no perching).
- Right (to right-hand side of nest onto roof beam).
- Left (left-hand side onto roof beam).

Neither of the adults used the front of the nest, possibly due to the close proximity of the camera and edge of the aviary. The female used the other three sides almost equally while the male used only the left or right sides of the nest, with the right being preferred (81%). Change over of nest duties was in the majority of instances carried out using opposite or different sides of the nest (77%), but exchanges from the same side were also observed (23%).

Fig 7. Direction of nest exchanges by adults



The chick fledged at 30 days having been seen wing-flapping and moving around the nest platform up to four days prior to fledging. When the chick fledged it was caught, weighed and ringed. The fledgling weighed 440g, and it was ringed using a Y-size closed ring measuring 15.7mm. The chick was then released back with the adults. At this age the chick was almost identical to the adults in all but size. However, the overall colour was duller than that of the adults and the dark bar below the grey wing-bar was absent. This bar had still not appeared when the juvenile was one year old.

Juvenile birds

The chick remained with the adults until March 15th 2000, when it was removed to an aviary in the main indoor area. The chick was then aged eight months and weighed 1.9kg. The adults had laid whilst the chick was still in the aviary with them, but unfortunately this egg failed to hatch. It is unknown why it did not hatch but the chick spent time with the male when he was incubating and it is thought the chicks presence may have led to incorrect incubation.

The adults laid again on March 4th 2000 and successfully incubated and reared a second chick. This chick was subsequently removed from the adults at the age of 116 days. It weighed 1.55kg. The adults immediately began nest building again.

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BOOK REVIEWS

THE PLIGHT OF PARROTS

The plight of parrots is the main subject addressed in the *International Zoo Yearbook* Volume 37. A total of 32 papers submitted by leading experts from around the world is contained in a special section. Dr N. J. Collar provides a scene-setting overview of the 90 species of parrots presently threatened with extinction, while Dr Roger Wilkinson contributes a comprehensive and interesting overview of captive-management programmes and regional collection planning for parrots.

Other papers deal with the breeding of Palm Cockatoo (Rotterdam Zoo), Salmon-crested Cockatoo (Loro Parque) and Pesquet's Parrot (Jurong BirdPark and San Diego Zoo), husbandry and breeding of Blue-eyed Cockatoo (Chester Zoo), breeding programme for St Lucia Amazon (Durrell Wildlife Conservation Trust, Jersey) and a temperature-controlled nest-box for Thick-billed Parrots (Phoenix Zoo). A review of the most common viruses affecting Psittaciformes is contributed by members of the Psittacine Disease Research Group, College of Veterinary Medicine, University of Georgia. Among the infections dealt with are psittacine beak and feather disease, Pacheco's disease and polyomavirus.

Section 2 has papers dealing with growth and mortality of Black Stilt (Department of Conservation, Wellington Conservancy, Wellington, NZ) and an account of the successful breeding of Writhe-billed Hornbill (Audubon Park and Zoological Garden, New Orleans).

The International Zoo Yearbook Volume 37 costs £73.00 and is available only from the Zoological Society of London, Regent's Park, London NW1 4RY.

Frank Woolham

DISEASES OF FREE-RANGE POULTRY

Victoria Roberts is now a lady of letters. In between her excellent *Poultry for Anyone* (reviewed in the *Avicultural Magazine* Vol. 104, No.2, pp.88-89) and the latest title, *Diseases of Free-Range Poultry*, she has worked hard at veterinary school in Liverpool and emerged as Victoria Roberts, BVSc, MRCVS, one of a relatively small number of veterinary surgeons who really do know a thing or two about avian medicine.

In his foreword, Prof. John E. Cooper emphasises that recognition of disease - and health - in poultry requires powers of observation as well as veterinary knowledge, pointing out that Victoria Roberts is uniquely qualified to teach these. He adds, 'She leads a remarkably full life, much of which

revolves around the countryside and the keeping of animals. She shares her home with a fascinating array of livestock and yet still finds time to continue her veterinary studies - and to write books! I have the greatest admiration for Victoria and I am delighted that she is to join the veterinary profession. In doing so she will bring with her years of experience and that sound, commonsense attitude to animals and their welfare that is so needed in our society.'

Diseases of Free-Range Poultry is, as anyone who knows Victoria Roberts would expect, written in a breezy, no-nonsense style. Based on the author's practical experience with a wide variety of birds (waterfowl, pheasants, quail and quite a lot more in addition to domestic poultry) it is hugely informative and will be of interest and value to everyone who keeps such birds.

Although some of the chapter headings - for example Skeletal and Locomotive Systems, and Endocrine and Lymphatic Systems - might at first seem more at home in a veterinary dictionary, don't be put off for Victoria Roberts is wonderfully lucid in her explanations.

Potential diseases and other health problems are discussed in separate chapters. Common ailments are described and treatments recommended in appropriate detail by means of charts. Specific drugs are identified with a reminder that many are available only via a veterinary surgeon.

Books about livestock husbandry are popularly described as 'practical guides' but many fail to live up to such optimistic descriptions. This one does. It is informative and full of the kind of advice that can only be provided by an author who is really in touch with their chosen subject.

Published by Whittet Books Ltd., Hill Farm, Stonham Road, Cotton, Stowmarket, Suffolk IP14 4RQ, *Diseases of Free-Range Poultry* costs £15.99.

Frank Woolham

WHO KILLED THE GREAT AUK?

The Great Auk, commonly referred to over the centuries as the Garefowl or Penguin, is well known as one of the bird species that have been driven to extinction by man. The demise of this handsome bird is a sad tale of greed and cruelty which took place on rocky islands in the North Atlantic. These birds provided meat and eggs for remote communities who culled them in a sustainable manner, but economic and social pressures in the eighteenth and nineteenth centuries led in a relatively short time to their extinction. This story is particularly poignant now when so many species are being threatened as a result of our own population growth and rampant consumerism.

This book consists primarily of extracts from letters and diaries, and

jumps from century to century, and island to island in an erratic fashion. It provides a catalogue of diverse descriptions of the bird which amply demonstrate how few bird enthusiasts actually ever encountered it.

Probably a book for Great Auk and history enthusiasts only, *Who killed the Great Auk?* by Jeremy Gaskell is published by Oxford University Press, Great Clarendon Street, Oxford OX2 6DP. E-mail: science.books@oup.co.uk It is priced £18.99.

Shirley Ellis

BIRDS OF AFRICA

The Birds of Africa Volume VI, includes such groups as starlings, sunbirds, white-eyes, shrikes, orioles, bulbuls, drongos, crows, babblers and picathartes, so is of great interest to birdkeepers. The authors include Roger Wilkinson, General Curator: Vertebrates and Research at Chester Zoo and a Council Member of the Avicultural Society, who wrote the Chester Zoo Review 2000 in this issue of the magazine. The Emerald, Ashy, Golden-breasted, Shelley's, Hildebrandt's, Superb, Chestnut-bellied, Fischer's and White-crowned Starling species' accounts are Roger's contribution to this splendid volume.

The species' accounts by Roger and other specialist authors are as you would expect in such a work. They include detailed descriptions of each species and subspecies, their range and status, food and breeding habits. Invaluable information that will help birdkeepers accurately identify species and subspecies, formulate their diets and breed them successfully. The last but one volume, it has 724 pages, and obviously I have not read every page, but have merely dipped into those covering species I feel I know well. Flicking through some of the other pages I did spot that something has gone wrong at the end of the first paragraph of p.505. The Western Black-headed Oriole is described as occurring: '...also on Mts Moroto and Elgon in E Kenya, only Kakamega.' Presumably, it should read: 'in W Kenya only Kakamega.'! It does not reach eastern Kenya. As is stated at the beginning of the account, this oriole ranges from Guinea, West Africa, eastwards as far as western Kenya and as the distribution map clearly shows, Mts Moroto and Elgon (at least the part of it shown in red) are in eastern Uganda and Kakamega is in western (not eastern) Kenya.

The 36 colour plates by Martin Woodcock illustrate all the species and many subspecies. They are very impressive although I do have a relatively minor criticism. All of the birds on plate 1 are beautifully painted except for the Grey-necked and White-necked Picathartes, which appear to have been added rather hurriedly as an afterthought when there was not quite enough space left on the plate for them, and this perhaps explains why the White-

necked species has no neck and that of the Grey-necked is too short. The line drawings by Ian Willis illustrating nests and various aspects of behaviour are also of a high standard though he too has drawn the Grey-necked Picathartes (p.5) with an unusually short neck.

The Birds of Africa Vol. VI, edited by C. Hilary Fry, Stuart Keith and Emil K. Urban is published by Academic Press, Harcourt Place, 32 Jamestown Road, London NW 7BY, UK and 525 B Street, Suite 1900, San Diego, California 92101-4495, USA. It is priced £99.

Malcolm Ellis

AUSTRALIAN ACTION PLAN

Launching *The Action Plan for Australian Birds 2000*, Federal Minister for the Environment and Natural Resources, Senator Robert Hill described it as 'a major resource for land managers throughout Australia in their efforts to save native birds and their habitat.'

Preliminary findings of a survey for Birds Australia revealed recently that one in five Australian bird species is sliding towards extinction, with land clearance being the main threat to their survival. Such is the sad plight of Australian birds that the *Action Plan* is the size of a telephone directory! The 680 pages list 32 taxa as being critically endangered, 41 as endangered, 82 as vulnerable and 81 as near threatened.

Those critically endangered include Coxen's Fig Parrot, the Orange-bellied Parrakeet, Night Parrot and southern subspecies of the Star Finch *Neochima ruficauda ruficauda* the population of which is thought to contain fewer than 50 mature individuals. Those in the endangered category include the Cape York Peninsula populations of the Star Finch *N. r. clarescens*, the white-bellied Crimson Finch, Gouldian, Golden-shouldered Parrakeet, Swift Parrakeet and a number of black cockatoo populations. The Pictorella Mannikin, Diamond Firetail, western Star Finch *N. r. subclarescens*, Western Rosella *Platycercus icterotis xanthogenys*, Tasmanian subspecies of Eastern Rosella, Torres Strait and Cape York Peninsula subspecies of the Eclectus Parrot, eastern Major Mitchell's Cockatoo and Palm Cockatoo are among those adjudged to be near threatened. The southern subspecies of the Black-throated (or Parson) Finch is among those considered to be vulnerable.

The Action Plan for Australian Birds 2000, written by Stephen T. Garnett and Gabriel M. Crowley, is available free from government bookshops in Australia. It is also on the website of Environment Australia: www.biodiversity.environment.gov.au/threaten/index.html from which the pdf files can be downloaded.

Malcolm Ellis

GUIDE TO ECUADOR AND ITS GALAPAGOS ISLANDS

The Ecotravellers' Wildlife Guide to Ecuador and its Galapagos Islands by David L. Pearson and Les Beletsky is similar in style and format to the guides to Costa Rica, Tropical Mexico and Hawaii reviewed in earlier issues (Vol.104, No.4, pp. 182-183, Vol.105, No. 3, p.141 and Vol.107, No. 1, p. 41).

The Galapagos Islands and Ecuador were in the news earlier in the year because of threats to their wildlife. There can be few if any members who did not see at least some of the extensive coverage of the Galapagos oil spill, though like so many disasters it quickly disappeared from the headlines, leaving us wondering as to the true extent of the damage done to the birds and other wildlife of these islands.

A less high profile story was that of Ecuador's plan to drive an oil pipeline through one of South America's most wildlife-rich regions. One of the two proposed routes for this extension to the trans-Ecuadorian pipeline poses a threat to the Mindo Important Bird Area (IBA). South America's first designated IBA, it is home to some 450 species including 12 found in no other country and 12 classed as threatened or near threatened.

Species under threat include the Cock of the Rock *Rupicola peruviana*, Plate-billed Mountain Toucan *Andigena laminirostris*, Black-breasted Puffleg *Eriocnemis nigrivestris* and Tanager Finch *Oreothraupis arremonops*. Very early on (p.4) the authors point out that oil dominates most political decisions in Ecuador, and the oil industry usually has its way. It is just one of many threats to Ecuadorian wildlife.

The Ecotravellers' Wildlife Guide to Ecuador and its Galapagos Islands is published by Academic Press, Harcourt Place, 32 Jamestown Road, London NW1 7BY, UK and 525B Street, Suite 1900, San Diego, California 92101-4495, USA. It is priced £19.95 in the UK, US\$27.95 in the USA and \$38.95 in Canada.

Malcolm Ellis

PORTFOLIO OF COCKATOOS

The long-awaited second part of William Cooper and Joe Forshaw's very special publishing project became available recently. Both parts feature birds which are popular with aviculturists - first (in 1997) touracos, now cockatoos. The portfolios reproduce the work of Bill Cooper, one of the world's foremost bird artists, to the highest possible standards and in full size.

This artist needs no introduction to parrot enthusiasts. He illustrated *Parrots of the World* and, in the 28 years which have passed since its publication, has created some of the finest parrot art the world has seen. In

this portfolio of watercolours, one can marvel at the way he has captured Leadbeater's (Major Mitchell's) Cockatoos feeding on melon seeds - a female with half-raised crest, a male in full display with his open salmon-coloured underwings and spectacular crest, contrasting with the gnarled dead branch on which he stands, and the arid sepia-coloured earth.

In another plate, a male Red-tailed Black Cockatoo lifts his wing and calls in a threat display, at the side of his female whose delicately spotted and barred plumage is depicted with beautiful precision. The birds are perched on a dead tree over a creek, against a backdrop of cliffs and boulders. In Bill Cooper's paintings, every detail from knot-hole to insect-ravaged leaf, is illustrated with care and artistry. But it is his knowledge of the species and its behaviour which sets his paintings apart from those of other artists.

Joseph Forshaw has written the text; departing from his usual style, it forms an elegant essay interspersed with the plates, along with the artist's notes. The portfolio consists of 21 colour plates, each reproduced in its original size of 75cm x 57cm (approx. 29½in x 22½in). Each plate has been printed to the highest standards of technology and craftsmanship available today, as was the case with *Turacos*, which won a gold medal for limited editions at the Australian Print Awards. *Cockatoos* is presented in a hand-crafted folio box, which is gold blocked, and covered in dark Oxford green cloth. Such quality and the fact that it is a collectors' edition of 460 sets, inevitably brings a high price tag. It is published by Nokomis Editions (PO. Box 319, Clifton Hill, Victoria 3068, Australia) at AU\$4,970. The e-mail address is: nglavish@nokormis.com.au and the website is: www.nokomis.com.au

This portfolio surely represents a publishing landmark.

Rosemary Low

NEWS & VIEWS

AVIARIES FOR THREATENED PARROTS

With the support of the Loro Parque Fundación, six aviaries are to be constructed at the Mar-it Conservation Park, Panay, and the Negros Forests & Ecological Foundation's Biodiversity Conservation Centre in the Philippines. The aim is to construct high quality breeding aviaries for various threatened endemic parrots which have been donated by private owners or confiscated and deposited there by the Philippine Department of Environment and Natural Resources. The species in question are the Blue-crowned Racquet-tailed Parrot *Prioniturus discurus whiteheadi* and Visayan Blue-naped Parrot *Tanygnathus lucionensis salvadorii*. Other threatened species including the Red-vented Cockatoo *Cacatua haematoropygia*, Blue-backed Parrot *T. sumatranus everetti* and Visayan Hanging Parrot *Loriculus philippensis regulus* have been offered in the past but had to be turned down because of the shortage of suitable accommodation. The above will complement the fundación's ongoing work on the conservation of the Red-vented Cockatoo on the island of Rasa, near Palawan.

* * *

LARGEST IN THE WORLD

Ownership of Pica Press, publisher of such books as *Munias and Mannikins* by Robin Restall and *Parrots* by Tony Juniper and Mike Parr, has passed to A & C Black, publisher of the Christopher Helm imprint, responsible for *Birds of Kenya and Northern Tanzania* by Zimmerman, Turner and Pearson and several other identification guides. Now with over 110 titles, it is said to have the largest list in the world.

* * *

A QUESTION OF PREFERENCE

In *Birdscope* Spring 2001/Volume 15, No.2, André A. Dhondt and Tina Phillips pose the question, does the orientation of nest-boxes affect the breeding success of cavity-nesting birds? Data collected in North America suggests that at northern latitudes nest-boxes facing in easterly directions, especially those facing north-east, fledge on average more young Eastern Bluebirds *Sialia sialis* than boxes facing in other directions. There is no discernible effect on nesting success at southern latitudes. It is suggested that it is beneficial to breed in east facing nest-boxes at northern latitudes, where night-time temperatures tend to be lower, and that this supports the hypothesis that easterly facing nest-boxes warm-up more quickly in the early morning sun.

INDIAN IN ORIGIN

A population of over 1,000 Ring-necked or Rose-ringed Parrakeets *Psittacula krameri* has now become well established to the west of London, along with smaller populations in south-east London and on the Isle of Thanet, in Kent. In *British Birds* 94, 2: 74-79 (February 2001), Dr Josephine A. Pithon and Calvin Dytham, describe their attempt to determine the origin of these British feral populations. They conclude that British specimens vary little, and all are clearly of the Indian type. The west London birds may derive from a mixture of *P. k. borealis* and *P. k. manillensis*. The west London population seems to lack any birds of African origin.

* * *

LONG LIST OF BREEDING SUCCESSES

Last year over 150 bird species bred at San Diego Zoo and San Diego Wild Animal Park, of which 130 or so succeeded in rearing young.

Among the species bred at San Diego Zoo were a North Island Brown Kiwi *Apteryx australis mantelli*, six Blyth's Tragopan *Tragopan blythii*, two Cabot's Tragopan *T. caboti*, a Kagu *Rhynochetos jubatus* (the first to be hatched in the USA for more than 30 years), three Sunbittern *Eurypyga helias major*, five Collared Lory *Phigys solitarius*, five Blue-crowned Lory *Vini australis*, five Pesquet's Parrot *Psittichas fulgidus*, a Double-eyed Fig Parrot *Cyclopsitta diophthalma* and six Horned Parrakeet *Eunymphicus cornutus* (probably the first ever success with this species in the USA).

A single Great Blue Touraco *Corythaeola cristata* was reared at the zoo, as well as three Micronesian Kingfisher *Halcyon cinnamomina*, two Racquet-tailed Roller *Coracias spatulata*, a Yellow-throated Laughing Thrush *Garrulax galbanus simaoensis*, three Eastern Friarbird *Philemon buceroides neglectus*, two Turquoise Tanager *Tangara mexicana*, a Spotted Tanager *T. punctata*, three Western Masked Tanager *T. larvata franciscae*, two Blue Dacnis *Dacnis cayana ultramarina*, five New Guinea Metallic Starling *Aplonis metallica*, two Superb Bird of Paradise *Lophorina superba feminina* and four Empress of Germany's Bird of Paradise *Paradisaea raggiana augustaevictoriae*.

Notable breedings at San Diego Wild Animal Park included nine Californian Condor *Gymnogyps californianus*, seven White-fronted Bee-eater *Merops bullockoides*, nine Boehm's Barbet *Trachyphonus darnaudii boehmi* and two Green Honeycreeper *Chlorophanes spiza*. Blue-bellied Roller *C. cyanogaster* bred in both collections, raising six young altogether. Several species of doves, pigeons and hornbills were bred again in both collections.

ZINC TOXICITY

In *Australian Aviculture* January 2001, Veterinarian Peter Holz wrote about zinc toxicity in Orange-bellied Parrakeets *Neophema chrysogaster* at Healesville Sanctuary, Victoria, where between 1993 and 1998, a total of 77 died. Post mortem examinations of 41 of these initially failed to find the cause of death. However, after samples of kidney, liver and pancreas of 15 were analysed, significant levels of zinc were found and this is thought to have been the most likely cause of death. The source of the excessive levels of zinc seems to have been the poor quality, unpainted, galvanised wire mesh used in the construction of the aviaries. The effects can possibly be alleviated by painting the wire with good quality paint which will not flake or chip, or by washing the wire with acetic acid (vinegar). Most significantly though, when the wire was replaced with nylon mesh, during the first four months only one bird died (of an unrelated cause) and the previously low fertility (54%-66% during 1995-1998) increased to 86%.

* * *

EXPO 2001

Tufts Animal Expo 2001 will be held October 10th-13th at the Hynes Convention Center, Boston, USA. The four-day conference and three-day trade exhibition is being organised by Tufts University School of Veterinary Medicine in conjunction with a number of affiliated institutions, organisations and associations. The aim is to create a forum where veterinarians, veterinary technicians and others involved with animals can come together for the purposes of education and to discuss health and welfare issues. Further information, including about education programmes and registration, can be obtained by calling 1-800-642-9429 or visiting the website at www.tuftsanimalexpo.com

* * *

QUEENSLAND BIRDFEST

Bird habitat in northern Queensland is under serious pressure from rapid development. With this in mind, BirdFest has been designed to help develop international tourism there and make bird habitat a valued tourism resource. October 10th-14th there will be films and lectures by leading Australian ornithologists, featuring birds of paradise, bowerbirds, kookaburras, cassowaries and the Golden-shouldered Parrakeet *Psephotus chrysopterygius*. There will also be two days of local field trips to see the birds in the wild, and pre- and post-conference tours. Further information is available from:- www.birdfest.net or Organisers Australia, PO. Box 1237, Milton, Queensland 4064, Australia. Tel: 07 3369 7866/Fax: 07 3367 1471/ e-mail: mail@orgaus.com.au

BIRDS AT CHEQUERS

Many British and some overseas members perhaps know of Chequers, in Buckinghamshire, as the official country home of British Prime Ministers. In earlier times it was the home of Hubert Delaval Astley (1860-1925), Chequers Court as it was known then having been inherited by his mother and subsequently owned by his brother.

The Rev. H. D. Astley, President of the Avicultural Society from 1921-1925 and Hon. Editor of the magazine from 1912-1917, spent his early days at Chequers, and had aviaries there. In a recent issue of *The Countryman* magazine Jerome Betts wrote of: 'his cranes patrolling near the terrace and his storks roosting on the chimneys.' Evidently he had a particular interest in storks, for Jerome Betts also wrote of his experiments with the rearing and release of storks, in the hope that they might become regular summer visitors, experiments that were frustrated by the storks equally regularly being shot by farmers who mistook them for 'molly urns' or herons.

He also established aviaries at Benham Park, Newbury and in Italy, where he had a villa at Varenna overlooking Lake Como. At Benham Park he completed his book *My Birds in Freedom and Captivity*, illustrated with his drawings and watercolours of both caged and wild birds. This appeared in October 1900. In 1912 he acquired Brinsop Court, Herefordshire, a fourteenth century manor house and had the property renovated and modernised and the latest aviaries installed.

The relocation of his collection to Brinsop was chronicled in the magazine. In Dave Coles' *First Breeding Records*, H. Astley is credited with the first breeding in Great Britain or Ireland of the Bar-headed Goose *Anser indicus* (1921), Green Junglefowl *Gallus varius* (1923), Hooded Parrakeet *Psephotus chrysoptergus dissimilis* (1912), Princess of Wales Parrakeet *Polytelis alexandrae* (1912), Pileated Parrakeet *Purpureicephalus spurius* (1909 with W. Fasey) and Orange-headed Ground Thrush *Zoothera citrina* (1911).

St Francis and various birds, including flamingos, feature in H. D. Astley's memorial window in Brinsop's little church.

* * *

HUNDREDTH CONDOR

On March 22nd the hundredth Californian Condor *Gymnogyps californianus* hatched at San Diego Wild Animal Park, bringing the worldwide count of these magnificent raptors to just over 160 - yet another milestone in this endangered species' journey back from the brink of extinction.

OBITUARIES

PROF. S. DILLON RIPLEY 1913-2001

Dillon Ripley, who has died aged 87, was for 20 years Secretary of the Smithsonian Institution, America's national museum.

A great-grandson of Sidney Dillon, founding chairman of Union Pacific Railroad, Sidney Dillon Ripley was born in New York in 1913. His interests in birds and the Far East started early and while still in his teens he built a duck pond at the family home at Litchfield, Connecticut, and began his lifelong interest in waterfowl.

He studied zoology and in 1936 joined an expedition to New Guinea. In 1939, he became an assistant at the American Museum of Natural History and in 1941 was awarded a fellowship at Harvard. On completing his PhD, he became Assistant Curator of Birds at the Smithsonian but was soon recruited by the wartime forerunner of the CIA, which wanted to make use of his knowledge of south-east Asia.

After the war, Dillon Ripley returned to Yale and became Professor of Biology. He made many field trips to Asia on behalf of the Smithsonian, the National Geographic Society and the Bombay Natural History Society. In 1947 he managed to gain entry to Nepal, where he rediscovered the Spiny Babbler, which had not been recorded for more than a century.

During the period 1960-1964, he was Director of Yale's Peabody Museum of Natural History and was then appointed Secretary of the Smithsonian. Dillon Ripley retired in 1984 and pursued a full-time interest in birds. Described as 'a mild-mannered authority on the birds of India', his books included the 10-volume *Handbook of the Birds of India and Pakistan*, co-written with Salim Ali, *Rails of the World* and *Search for the Spiny Babbler*.

He was appointed an honorary KBE (Knight Commander of the British Empire) in 1979. Prof. S. Dillon Ripley served as a Vice President of the Avicultural Society 1986-1991.

DON ECKELBERRY 1921-2001

Too late for inclusion in the previous issue of the magazine came news of the death of Don Eckelberry. He died January 14th, a few months short of his 80th birthday. Here in the UK he is known primarily for having painted the colour illustrations for *Birds of the West Indies* by James Bond (Collins, 1960). In his native USA though, Don Eckelberry was a celebrated bird artist, who painted illustrations for a number of important books and later produced many fine bird paintings. The late Jean Delacour is quoted as having considered him the 'best bird artist of the day.'

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BOOST FOR DOMINICA FORESTRY DIVISION

Roger Sweeney, Graeme Hall Bird Sanctuary, Barbados, West Indies writes: 'Forestry officers of the Dominica Forestry Division have received a boost to their successful field conservation programmes with the pledge that every officer (23 in total including both senior and junior ranks) will receive a free copy of the new *Conservation Handbook* written by William Sutherland of the University of East Anglia, the author of several books highlighting practical techniques for monitoring natural ecology.'

'His two main objectives when writing this latest book were firstly to produce a practical guide to all aspects of field ecology and conservation; and secondly to get the book into the hands of as many field workers as possible in developing countries, in which the technical information will be most effective. Under an agreement called the gratis copies project, the author negotiated an agreement whereby almost half the copies will be distributed free to field workers in developing countries. The publishers, Blackwell Science, will provide these copies at cost price, and the author's royalties will cover the remaining cost. A grant from the Christensen Fund will cover the cost of postage. The free copies will be dispatched by Natural History Book Service Ltd., 2-3 Wills Road, Totnes, Devon TQ9 5XN, UK. E-mail:nhbs@nhbs.co.uk.'

'The project has so far pledged almost 400 copies to field workers in developing countries. The pledge of 23 copies to the Dominica Forestry Division will provide great practical support to its training and field programmes. The project has also pledged copies to field workers elsewhere in the eastern Caribbean, including on St Vincent and Barbados.'

* * *

LOGGERHEADS AT SAN CLEMENTE

To date, 150 San Clemente Loggerhead Shrikes *Lanius ludovicianus mearnsi* have been hatched at the Zoological Society of San Diego's breeding center on San Clemente Island, off the coast of California. As the result of the dedicated efforts of the staff at the Avian Propagation Center, the CRES (Center for Reproduction of Endangered Species) Behaviour Division, and a team of navy-sponsored biologists, the programme to save this critically endangered shrike has reached a milestone, with a record number of released birds surviving the winters and reproducing in the wild. Despite the zoological society's propagation and research breakthroughs though, the future of this shrike rests with the recovery of the island's fragile plant communities, which constitute its only natural habitat.



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