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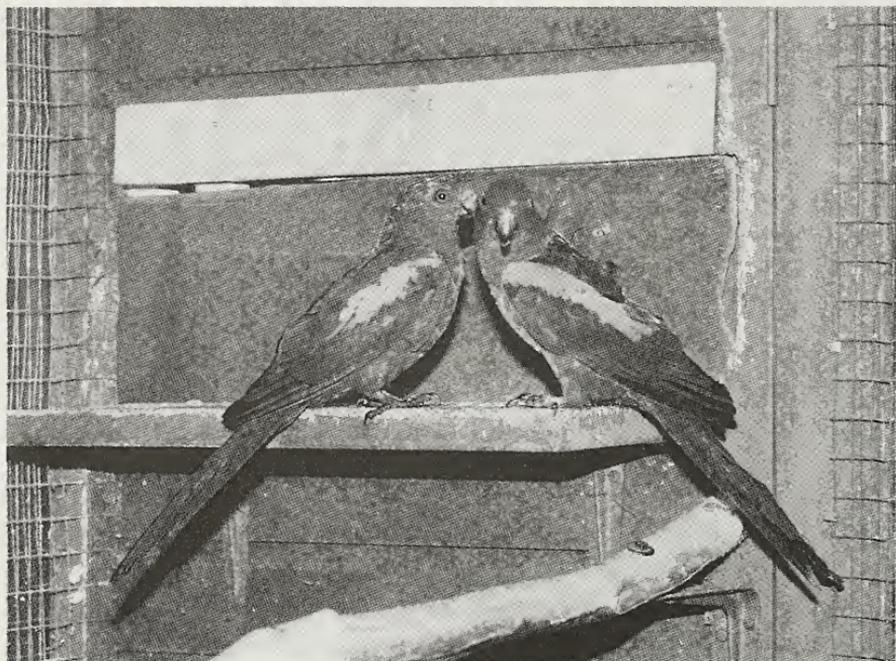
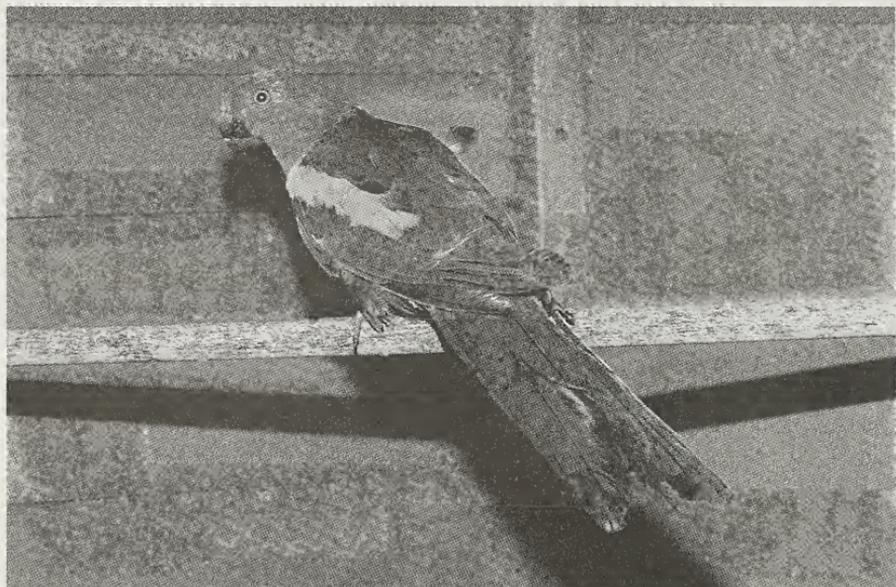
# AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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*Dulcie Cooke*

**Moszkowski's Green-winged King Parrot**  
The single bird is a cock. The hen is on the left of the pair.

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## MOSZKOWSKI'S GREEN-WINGED KING PARROT

By Dulcie Cooke (Epsom)

Moszkowski's Green-winged King Parrot *Alisterus chloropterus moszkowskii* could be considered one of the most exquisite of a large family of birds well known for their spectacular appearance. In these birds nature has thrown some of her most brilliant colours together in an extravaganza of flamboyance only matched by the grace and beauty of their flight. It is in flight, so light and fast, that the richness and intensity of those purples, scarlets and greens can be caught by the sunlight to form a living dream of glittering colours, making an unforgettable impression on the viewer.

Green-winged King Parrots have always been rare in the U.K. although over a period of many years commencing at the beginning of the century a few specimens have been imported. Alfred Ezra was the first to breed them in this country, in 1945. They have also been bred in Holland, in Denmark, and in 1987 at Loro Park in the Canary Islands. There are said to be more of them in Germany and Switzerland.

In their wild state the race *Moszkowskii* inhabits West Irian and Northern New Guinea as far east as Aitape on the northern coast. They are found mainly in dense rain forests on the slopes of low mountains, but they occasionally go almost as high as 8000 ft. and visit cultivated areas at high altitudes. They progress through forest areas on the lower or middle branches, and fly through the trees, not above them. They may be seen singly or in pairs or sometimes in small groups of up to six birds. Perhaps these groups comprise parents and their young. Their flight is straight and very strong.

Rosemary Low writing in her book *Endangered Parrots* published in 1984 says of Indonesia "A 4000 mile stretch of islands ... of which Java is the most densely populated with (at that time) 95

million of Indonesia's 150 million people." The large areas of dense rain forest where Moszkowski's live in West Irian New Guinea stand a better chance perhaps of surviving Indonesia's main export, wood, because of their inaccessibility to transport. Obviously the magnificent Moszkowski's King and many other species of parrot and Lory will stand a much better chance of surviving and extending their populations as long as the rain forests are left intact.

The World Wildlife Fund has been active in helping to fund various projects with the support of the Indonesian Government to create forest reserves and protected areas to help conserve the flora and fauna from the threat of deforestation by the logging companies and the local populations who often gain a livelihood from cutting down trees and selling the wood. There would not appear to be any risk of wild populations diminishing at present, thanks in part to the wild and unpopulated areas in which they live, and in part to the creation of these protected areas where Moszkowski's King parrots appear to have every chance of thriving in their remote rain forest domains.

The following description may help readers to identify these birds should they see or acquire them and also, hopefully, will add further aids to identifying the difference between the adult males and females beyond those which are available at present.

#### **Male**

The male weighs about 7 oz. and is about 14 " (36cm) long. Its call is distinctly softer than that of Australian Kings and varies considerably. For example, it is a plaintive call when it is dark and cold and he wants to be told to go to bed in his house! The head, neck, breast and underparts are all a brilliant scarlet, a rather deeper shade than that of Australian Kings. The shoulders and wings are deep green, and the very light green wing stripe is wide and long and very conspicuous. The entire back from the nape of the neck down to the rump is a deep rich purple which quite literally "glitters" in the sunlight. The tail is a rich very dark blue above and black underneath with sometimes the odd "fleck" of red. The beak is quite large with the upper mandible scarlet at the base and black at the tip, and the lower mandible black. The legs are grey and the large expressive eyes are orange.

#### **Female**

The head, neck, breast and underparts of the female are brilliant deep scarlet like the male. She has the same deep green shoulders and wings and the same broad light green wing stripe. What is not made very clear in various descriptions is that she has the same rich

deep purple back extending from the nape of the neck right down to her rump. Her tail is rich deep blue above and black below. Her upper mandible is orange-scarlet at the base and black at the tip and the lower mandible is black. The feet are grey. Her eyes are big and orange just like her consort. Her weight can be rather less than his at a little over 6 oz. and her length is approximately the same.

The only way to be sure one has a female (because weights can vary in different birds) is the overlay of deep green feathers on the nape of the neck and extending across the back from the shoulders *when the bird is still*. When she flies, these feathers part to show a wholly purple back, making her look like a male. There can be a little purple band showing *above* the green on the nape of the neck even in repose.

Joseph Forshaw in *Parrots of the World* states that the young are like the female, except that the light green wing stripe is narrower and duller in colour and that the breast is marked with green feathers. Rosemary Low in *Parrots, their care and breeding* points out that the beak is mostly horn coloured in young birds.

It is of great importance to bear in mind that, like all Kings, either male or female can turn on their partner in times of stress, such as can happen when one member of the pair is in breeding condition and the other is not ready to breed. If it is the male who is in breeding condition and the hen is too young, too old, or is out of condition he can and in some cases does kill her. Therefore a very careful watch must be kept both on the condition of the birds and their disposition towards each other. Such a tragedy is much more likely to happen when the birds are not totally compatible. Clipping the flight feathers of one wing has a remarkable effect in the case of some birds and renders them much better tempered towards their mates but in certain cases it might be necessary to remove the cock altogether. Young birds, should they ever be produced, would be particularly vulnerable to a ferocious parent.

Moszkowski's Kings are not easy to acclimatize. They need a heated house for a long time when first imported. A temperature of 58 - 60° F will suit them very well but if the temperature falls much below that in the first months here the hen or hens will start to look distinctly unhappy. The face of a hen who is cold or unhappy for some reason, or not well, will quite literally go a shade or two darker in colour, only to go lighter again when she is warm, happy etc.

They are subject to infestation by various worms perhaps because, like Australian Kings, they spend some time on the ground

picking up all the odd bits they can find. Panacur Sheep wormer, *without Additives*, the 2.05% solution seems to suit them very well. I add one part of pure Panacur (the above solution) to 5 parts of water. There is a sediment so it must be shaken well. Catheters or tubes of any kind are never used. One and a half millilitres of the above mixture is drawn into a syringe with the needle removed, the nozzle of the syringe is put into the side of the beak and the plunger is gently and *slowly* pressed home, allowing the bird time to swallow. I find the best way to deal with these easily stressed birds is to catch them in a very large net, lay them on the floor, where they seem to feel safer and extract the head; this way they do not mind the whole process too much. If the birds are kept on a stone surface in their flight probably once per year would be sufficiently frequent to worm them, but if there is grass or there are plants in the flight I think it would be wise to worm them twice per year.

A careful watch must be kept for any signs of *Candida* growths, which can be cured if it is taken in its' very early stages. Any sign of weight loss or disinclination to eat hard seeds suggests that it would be wise to take the bird to a knowledgeable Avian Veterinarian for treatment.

The beautiful plumage of Moszkowski's needs spraying on every possible occasion when the weather is mild, warm or hot for, being rain forest birds, their feathers suffer and lose their sheen to some extent if they are allowed to become very dry. As they become acclimatised they gradually learn the habits of bathing in a large container of water, as do the thoroughly domesticated Australian Kings.

Moszkowski's Kings are quite happy with a rather smaller flight space than would be suitable for Australian Kings who need about 90 sq. feet and will use more if it is available. How the flight is shaped does not matter, birds fly round and round a square space just as much as up and down a long narrow space. In the case of the Moszkowski's Greenwings they seem to be extremely happy and full of life in about 60 sq. feet of flight space. Like the Australians they need a spacious house which can be totally enclosed at night in cold, wet and windy weather and during the winter months. One about 4' x 6' deep is large enough and this added depth gives them extra flying space and a sense of security, and is big enough to take a nest box in winter.

Although, once thoroughly acclimatized they are said to be hardy, they certainly need about 60 °F when first brought into the country from a warmer climate than our own, and later appear to

appreciate a little background heat of about 45 - 50 °F at night during the winter months. This can be supplied very effectively by tubular heaters.

The size of the house is important because with our English winters the birds spend a lot of hours shut in during the winter months. The house is best with a cement floor about 4 - 5" thick. It is a great advantage to have light in the house at night, a low watt light enables the birds to feed late in the evening and early in the morning in the winter. The birds will benefit greatly from the insulation afforded by an interlined roof to the house. External quality hardboard or plywood stuffed with about 3 - 4" of a roof insulating material will repay the trouble and expense by saving on the heating and by producing more contented birds.

All Kings are nervous and easily stressed. It is therefore wise to "double-wire" the flight, with an inch between each sheet of wire and "spacers" made of wood to stretch the wires taut and keep them apart. Our flight roofs are all covered with PVC corrugated sheeting or glass fibre sheeting, fixed at a slight angle to permit drainage. We know of Kings who have killed themselves by concussion as a result of a Hawk diving on the unprotected flight roof. Kings, and this includes Moszkowski's, spend quite a lot of time on the ground, so a flight floor made of paving or ornamental stones laid one quarter of an inch apart in sand or fine soil makes an excellent floor. It drains well, the birds like looking for sprouted seeds between the stones and it is easy to wash and sweep clean.

Nest boxes for Kings need to be large, but individual Kings do show preferences for boxes of varying sizes, between 10" sq. and 3' deep for an Amboina which bred for Jim Hayward, to the more usual 12" sq. and 5' deep used by many breeders of Australian Kings. Nest boxes can be set on a paving stone on the ground and this will discourage insects from trying to enter. Obviously an internal ladder and an inspection door are essential. Nesting material varies, some breeders of Kings use rotted wood, others use peat, yet others like my husband and I use a mixture of peat and wood shavings for our Australian Kings, and I would think this mixture would be acceptable to the Moszkowski's.

Thomas Arndt writing in his *Lexicon of Parrots* on Moszkowski's states "breeding in Aviculture is seldom achieved" and further that "breeding begins in March ... two to three eggs are laid ... incubation is 21 days, fledging period is 35 days, young are independent after 50 days". This valuable information gives a clue to the difficulties which most British breeders who are fortunate to

own these birds must encounter with their future breeding projects. In all but a few very sheltered parts of the British Isles March can be a fiendishly cold month, enough to put most hens off thoughts of breeding, or to risk the lives of chicks if they are hatched. I wonder would the answer to this problem be to put the nest box in the (heated) house for the winter and early Spring months and to move it outside for the Summer. These birds are reputed to be double brooded so even if they would not breed in the house, there is the second chance outside in the Summer months.

Feeding can be difficult when these birds are moved, so it is best to put seed, soft foods, fruits and water in many places until the birds settle down and show their preferences for feeding places. Many Kings will starve rather than eat from a container or a position they do not like, or food which they dislike, so it is best to be very flexible and watchful in the early days. We have Australian Kings here who flatly refuse to eat a varied mixture of choice "soft foods" from a bowl next to their seeds on the feeding shelf, but if the same food is emptied into one of their feeding cups and clipped to the wire of the flight they will eat it all immediately.

The foods suitable for Greenwing Kings are the same as those given to Australian Kings, although they seem to be even more fond of fruit and greenfood. Ours took a long time to show any interest whatsoever in branches of Apple, Willow and Hazelnut, something for which the Australians will leave all other foods. Fruits eaten with great enjoyment include apple peeled and with the pips removed, pieces of melon and orange halves with honey or sugar added. These are best "spiked" on to nails to keep them upright. It is necessary to remove the skin of oranges which may contain lethal sprays which washing cannot remove. Many other fruits could be tried. Lettuce, watercress and endive are all eaten but no wild foods are given because of the risk of their having been sprayed with lethal materials. The "soft food" consists of brown bread made moist and then crumbled, soaked and cooked sweet corn, garden peas, chick peas, cut up grapes, sultanas, raisins, occasionally hard-boiled yolk of egg and even a little grated Cheddar cheese.

If the birds show sign of going to nest then it would be advisable to start giving them a good rearing food, such as Cédé, but this food would be too stimulating for the Autumn and Winter months, and given all the year round such a rich diet would be likely to affect adversely the birds' livers. Foods additional to the basic seed diet of sunflower, safflower, canary seed and millet seeds are peanut kernels, cut up walnut kernels and the various pine nuts. The latter

must be watched in the Spring and Summer months because they have a tendency to go mouldy from the inside without showing any outward signs. Wheat and oats are eaten in small quantities and of course millet sprays are greatly enjoyed but they must be rationed, or the birds will eat no other seeds. Cooked brown rice is eaten and one of the greatest treats of all is corn on the cob. Moszkowski's are not chewers of wood and leave their houses and flights all in one piece.

It is very much to be hoped that these rare and beautiful birds will, in the hands of experienced bird keepers, become established here and on the Continent of Europe so that eventually breeding stocks may be established to enable them to take their place beside the now domesticated Australian Kings as a part of the great kaleidoscope of beauty and form which is the Avicultural scene of this century.

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The breeding of the Green-winged King Parrot, in 1945 by Alfred Ezra, which the author mentions, was that of the nominate race. Ezra's pair continued to breed successfully on several occasions until 1954 when they were acquired by Crawford McCullagh, with whom they fared poorly and, subsequently, by Alfredo Marques with whom they did better and produced more youngsters. I believe that the race *Moszkowskii* had never been imported into this country until the early 1980's since when they have been kept and bred by a few aviculturists, one of whom has been particularly successful.

Ed.

## BREEDING THE WHITE-TAILED BLUE ROBIN

By B. Woodley (New Milton)

In February 1990 I was fortunate to obtain an adult male White-tailed Blue Robin *Cinclidium leucurum* in excellent condition. It was singing within days of being put into its new quarters which consisted of a flight approximately 14' x 4' 6" x 7' 6" high and which occupied the entire space available between my garage and my neighbour's boundary wall. The roof was covered in with clear corrugated plastic sheeting and the ends were close boarded, with only a small wire door at the southern end to allow access and assist with ventilation. Feeding was done via a large garage window on to a wooden tray screwed to the windowsill and, therefore, disturbance was kept to a minimum. The aviary floor was covered with a deep oak and beech leaf litter to which was added a scattering of moss covered logs and decaying branches. No heating was provided. Also sharing the aviary were a pair of Hardwick's Fruitsuckers and a pair of Fairy Bluebirds (which also bred successfully and will be the subject of a separate article). Previously the Yellow-vented Bulbul *Pycnontus goiavier* had bred here in 1989. In the upper canopy of the flight hanging baskets planted with assorted honeysuckles together with container grown plants were suspended from the roof, and an evergreen *Clematis amandii* was planted in the floor.

In May 1990, I was able to obtain an established hen White-tailed Blue Robin. Initial introductions in the flight proved impossible for the cock had a strongly established territory and was in peak condition. When the hen was introduced he put on a magnificent display, pulling himself into a variety of thin drawn shapes and postures with tail fanning, head swaying, and wing drooping. This was all too much for the hen who quickly retreated to the foliage of a hanging basket. It quickly became apparent that it was too late now (mid May) to try a pairing in 1990 and the hen was reluctantly removed to separate quarters for the winter.

In late March 1991 I re-introduced the hen to the same flight but kept her at first in a large cage on the floor. The cock spent all his time sitting on a log in front of the cage. On 12th April 1991, the cage door was opened and the hen was released. Again a fantastic display by the cock followed but, this time, none of the previous aggression was shown. On Tuesday 3rd May the hen was seen

carrying leaves and coconut fibres and, peering through the open garage window, I was amazed to see a deep cup-shaped nest taking shape on the floor in the leaf litter in the right angle formed by the garage wall and the wooden end of the aviary. The nest was a classic type Robin nest. The hen, who was finger tame, carried on nest building as I stood and watched, tearing fine pieces of moss from logs and also using fine coconut fibre to line the deep cup which merged into the surrounding leaf litter. On the third day of nest building came a sudden surprise. Just when the nest appeared complete a canopy or hood was constructed over the open cup, using ounces of coconut fibre plus a scattering of moss and odd pieces of leaf. By 7th May, the canopy appeared almost complete and access to the nest was only possible via a small lateral entrance tunnel through which the hen disappeared. On Wednesday 8th May 1991 at 6 - 7 a.m. the hen was no longer apparent in the aviary and I took it to mean that egg laying had commenced. At this time the nest was difficult to see when viewed from above through the open garage window and appeared like a slightly raised pile of disregarded fibres. I referred to 'Baker' whose Indian nesting activities were well documented. He, also, referred to this hood or canopy over the nest, which was nearly always present when there was no projecting bark or tree stump over the open cup.

On Saturday 11th May 1991, the hen appeared to commence incubation and I noted that the cock resumed his short tinkling song having been quiet for about a week or so during nest building and egg laying. On Saturday 25th May there was no sign of hatching. Not having been anywhere near the nest to date, I felt a quick check might not go amiss. A quick inspection revealed 4 eggs very similar in size and colour to those of a European Robin. Three were fertile and chipping and one was clear. Hatching finally took place on the following day. I saw, at the furthest extremity of the aviary from the nest, a fully developed chick hanging out of a pile of remnant egg shells. Meanwhile, faint cheeping from the nest indicated that at the most two young could be left. I was fortunate at this time to be on holiday and I collected small spiders, small green caterpillars and centipedes to supplement the mini mealworms and ant pupae. As the young grew, centipedes, wax moth larvae, woodlice and small earthworms were also readily accepted. These latter items made feeding easier and the hen chose wax moth larvae in preference to most other forms of live food. On the 2nd June 1991, as I left for the Avicultural Society President's Garden Party, two strong healthy young were calling from the nest. The cock bird was

a good feeder and I noticed that, at times when he had an excess of food, he would fly to the hanging basket and hide his catch, presumably to be retrieved later, although I never actually witnessed this. About 7.30 a.m. on Sunday 9th June, 14 days from hatching, two well developed perfect chicks fledged from the nest. I should add at this stage, apart from a dusting of the food with grated cuttlefish, no mineral or vitamin supplements whatsoever were used.

It was quickly apparent that the chicks were one of each sex. The young male was a rich dark chocolate brown, with heavy fulvous speckling, on the breast and back. The hen was similarly marked but more of a milk chocolate colour. The young hen was the larger of the two and was fed by the cock. The young cock bird was fed exclusively by the hen and both young took up plots at opposite ends of the flight, near, or on the floor. Within hours of their leaving the nest, the hen was busy refurbishing it ready for a second round. This all seemed too good to be true!

On Friday 14th June 1991 I left for work and both birds were fine. When I returned at 5.30 pm. I was shattered to find that the young cock was dead on the floor with its head pecked to pieces having been killed by the adult cock bird. This really took the icing off the cake particularly as things had gone so well so far. On Saturday 15th June the hen was incubating a second clutch. This round hatched on 1st July 1991. The previously described routine was followed again but it was noted this time that the cock did not seem so interested in making as many visits to feed. On Friday 5th July I noticed 2 dead young scattered on the floor at the furthest end from the nest and a third chick dead at the entrance hole. Sadly that was to be the end of the season for within a few days both adults went into a moult.

The young hen was successfully reared and I am pleased to have been able to find another unrelated male for her in 1992. Next year, forearmed with the knowledge of 1991, I look forward hopefully to rearing a couple of broods at least.

\* \* \*

The White-tailed Blue Robin was hardly known to aviculturists until recently when a few specimens were imported by dealers. Raymond Sawyer kept a male but was never able to get it a mate. It is about the size of the White-capped Redstart and flicks its tail like a Plumbeous Redstart. The male's upper and underparts are

mainly deep blue, the sides of the head and neck and the central tail feathers are black and the outer tail feathers are white. The female is earthy brown, palest on the belly and throat. Her tail is brown, marked with white. The species is very widely distributed throughout China, Taiwan, Indo-China, Assam and Nepal. It normally frequents evergreen forests at an altitude of up to 8000 feet from which it descends when the weather deteriorates.

Ed.

This is probably the first successful breeding of the White-tailed Blue Robin in this country. Anyone who knows of a previous breeding in the U.K. is asked to inform the Hon. Secretary.

## NOTES ON THE BREEDING BIOLOGY OF WILD AND CAPTIVE CUT-THROAT FINCHES

By Neville Brickell and Arthur Wright  
(Avicultural Research Unit, Durban, South Africa).

During the breeding season the Cut-throat Finch *Amadina fasciata* becomes very aggressive. It occurs in pairs and associates freely with the Red-billed Quelea *Quelea quelea* and Red-cheeked Cordon-bleu *Uraeginthus bengalus*. In the courtship song the male stretches the neck, puffs out the breast feathers and advances towards the female in a rhythmic dance, which may last for up to four seconds, while emitting raucous humming notes. An immature male was first observed performing the courtship song at 46 days old. Nesting of the Cut-throat Finch seems to take place at the height of the dry season in most areas but one reference states that the species breeds "towards the end of the main rains" in southern Mozambique. Aviary birds will quite readily breed three times in a season, laying replacement clutches if the eggs are removed. Consulted works give the following months: Malawi March to May onwards; Zambia June; Zimbabwe January, March, April and September; Namibia February to August; South Africa December to May. The main problem associated with the captive breeding of this species is egg-binding, and therefore we encourage the birds to breed only during the warm months of September to April. We have not been fortunate enough to locate a nest in the field and have had to confine our findings to captive birds. We used cages measuring 2 x 1.25 x 1.25 m for our research. In their natural state a wide variety of nest sites are on record from low down in a thick bush to up to 4.5 m up in a tree. Besides constructing its own nest it commonly uses disused nests of the Red-billed Quelea *Quelea quelea*, Lesser Masked Weaver *Ploceus intermedius*, Spotted-backed Weaver *P. cucullatus*, Red-billed Buffalo Weaver *Bulalornis albirostris* and Social Weaver *Philetairus socius*. There are also records of a disused woodpecker's hole, probably that of the Cardinal Woodpecker *Dendropicos fuscescens* being used as well as cavities in buildings and fence posts. The aviary birds were supplied with the type of nest boxes used by Gouldian Finches. The nests consist of an untidy ball of dry grass, lined with feathers and with a short side entrance. A male was observed robbing the lining from a weaver's nest and taking it into another and a female

repeatedly trying to enter the nest of an incubating weaver. Our captive males carried nesting materials whilst the females arranged it. New material was constantly added to the nest throughout the incubation period. We originally placed grass, usually teff, in each empty box to which the males added further materials. Both sexes incubated, starting with the penultimate egg. The incubation period was measured between the times of laying and hatching of the last egg. We found this to be 12 - 13 days. Males incubated for periods of up to 3 hours at a time with females spending no more than 1 hour on the eggs but both sexes spent the night in the nestbox during the incubation period. The eggs were dull, chalky white. The aviary eggs had measurements averaging (18) 17.6 x 12.72 mm which is slightly larger than figures given in ornithological literature averaging (23) 16.8 x 12.6 (16 - 18.1 x 12.1 - 13.4). A normal clutch seems to be five, with three and sometimes up to nine being recorded. The latter suggests that two females were laying in the same nest. Our captive birds laid either five or six eggs. They were single or double brooded, replacement clutches being laid if the eggs were removed. The nestling period is 22 -24 days and the young feed themselves after leaving the nest. Adult plumage was attained at 70 -75 days and the birds were capable of breeding when they were 8 - 9 months of age.

#### **Development of the nestlings**

When they hatched the chicks were blind and naked with a blue-black skin. The gape was swollen and white in colour and the inside of the mouth was light yellow with blackish markings (as shown in the diagram). When they were 4 days old light grey down was evident on the back, shoulders, flanks, crown and nape, the bill was whitish with a greyish band across the centre of the upper mandible, the legs and feet were flesh coloured with greyish white claws and the eyes were closed with the eyelids black. At 6 days quills were evident on the wings but had not pushed through the skin. The eyes were still closed. Pin-feathers were just visible on primary and secondary coverts, greater and lesser coverts at eight days and the eyes were a quarter open. At 10 days the pin-feathers of the primary and greater wing-coverts were about 2.5 mm long and down was still in evidence on the crown and nape, at 13 days the primaries were 10 mm long with the tail and pin-feathers protruding 2 mm. The feathers on the back and breast were about 1 mm long and the eyes were half open and at 14 days the primaries were about 14 mm long and on the crown and nape the feathers were 1 mm long and the eyes were three quarters open. At 16 days the primaries were



Female Head

The Cut-throat Finch

Male

*N. Brickell*

19 mm long, the feathers on the crown, nape and the sides of the face were 2 mm, the tail feathers were growing rapidly and protruding 6 mm and the eyes were fully open. The feathers of the head had a bronze tint.

When the chicks were 18 days old red pin-feathers were visible on the cheeks of males and when they were 22 days old they were fully feathered, but with a few tufts of down still visible on the crown and nape and with areas of the belly bare. The primaries were 35 mm long and the tail 20 mm. They were fully feathered at 24 days. The mouthspots gradually faded after they left the nest, but they were still noticeable at 36 days.



N. Brickell

Inside of mouth of Nestling.

The jaw has been opened 180° to expose the whole mouth lining, the tongue and the tip of the mandible.

The total average weights of the nestlings (with full crops) are shown below:

Age (days)	Weight (g)	Age (days)	Weight (g)
4	4.1	16	17.0
6	5.9	18	17.2
8	8.0	22	17.0
10	10.0	24	16.0
13	11.0	27	15.0
14	15.3	29	All left the nest

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## INCUBATION AND NESTLING PERIODS OF LESSER AND GREATER VASA PARROTS

By R. Wilkinson, M. Pilgrim, A. Woolham and B. West  
(North of England Zoological Society, Chester)

Two species of *Coracopsis* parrots, the Greater Vasa Parrot *Coracopsis vasa* and the Lesser Vasa Parrot *Coracopsis nigra* are endemic to Madagascar and the nearby Comoros Islands. An endangered diminutive subspecies of the Lesser Vasa Parrot, the Seychelles Vasa Parrot *Coracopsis nigra barklyi* occurs on Praslin Island in the Seychelles.

Both species of Vasa parrots were uncommon in aviculture until the mid to late 1980's when so many were imported commercially from Madagascar that their low price resulted in a loss of interest in these fascinating parrots. As such, few people have enjoyed breeding these birds and relatively little has been reported on their behaviour in captivity. Details of their breeding in the wild are also largely unknown (Forshaw 1981) despite both species being relatively common in Madagascar (Rand 1936, Langrand 1990) although Low (1989) reports some details for the rare Seychelles Vasa Parrot.

Some controversy surrounds the duration of the incubation and nestling periods of parrots in the genus *Coracopsis*. In particular there appears to be disagreement between the recent writings of Tony Silva (e.g. 1991a, 1991b) and Rosemary Low (e.g. 1989). Low (1984) gives information indicating an incubation period of 18 days or less in the Seychelles Vasa Parrot and later Low (1989) quotes Becker (1987) that the incubation period may be as short as 13.5 days in *Coracopsis nigra nigra*. Silva (1991a) quotes Antonio de Dios for an incubation period of about twice this length at 25 - 28 days for *Coracopsis vasa*. Larger Birds of the same genus may be expected to have longer incubation periods in that there is a positive correlation between the size of the bird and the size of its egg and the latter with the period of incubation (Lack 1968, Skutch 1976). However, such a large difference would be unlikely and Silva's most recent writings indicate an incubation period of 23 days for *Coracopsis vasa* (Silva 1991b).

Lack (1968), in comparing different species of birds, noted a strong correlation between the duration of incubation and the length of the nestling period, suggesting that any evolutionary

change in the rate of growth in the egg would be matched by a similar change in the rate of nestling growth. In line with their differences in suggested incubation periods of *Coracopsis* parrots, Low and Silva also disagree on their nestling periods. Low (1989) again referring to observations on Seychelles Lesser Vasa Parrots in the wild suggests that these spend six weeks or less in the nest and notes that a bird of the nominate subspecies she hand-reared was fully fledged and of adult weight at five weeks old. Silva (1991b) notes a nestling period of 59 days for two Greater Vasa Parrots hatched and fostered under a pair of two females of the same species.

Below we consider observations made at Chester Zoo first on nests of Lesser Vasa Parrots and then on those of Greater Vasa Parrots.

#### **Lesser Vasa Parrots.**

Lesser Vasa Parrots have been held since 1982 at Chester Zoo where they were first bred in 1985 (James 1985, 1991). Because of concern over causing unnecessary disturbance to the nesting parrots the nest boxes were checked only infrequently and hence estimates of incubation periods for these earliest successful breedings were acknowledged to be approximate. In particular the suggested dates of laying were not confirmed by observation but indicated from dates on which the female was noted as spending mornings in the nest box. However the period of 18 days between when the female started "sitting properly" on 8th August 1985 and when two chicks were seen on the 26th August (then estimated to be two days old), suggests an incubation period as short as 16 days. These two chicks fledged on 30th September and 1st October 1985. If both chicks had hatched on 24th August this would suggest nestling periods of 37 and 38 days.

No nesting occurred in 1986 and although observations were made in 1987, 1988 and 1989 the nest inspections were not sufficiently frequent to ascertain incubation or nestling periods. More regular nest inspections were made by the keepers in 1990 and 1991. In 1990 the female was first noted as "possibly sitting" on 11th August and her changed behaviour on 27th August when she was seen out of the nest box being fed by a male suggested a chick (or chicks) had hatched after 16 days incubation. When the nest box was checked on 1st September "three chicks (possibly four?) almost 4 inches long and covered in a light grey down" were noted by the keeper concerned. Four chicks then almost fully feathered were seen on the 22nd September and these fledged on 3rd, 5th, 6th

and 13th October, indicating nestling periods of 37 to 42 days. Again the above observations were limited in that exact dates of egg laying and hatching were not obtained. This was largely due to a reluctance to disturb the birds more than was absolutely necessary. More complete data was gained in 1991 with exact dates for the laying of the first two eggs of a clutch of four and hatching dates for each of the three chicks hatched.

The nest-boxes used by the Lesser Vasa Parrots are of a grandfather-clock design and are only checkable by removing the box top. Checking thus causes more disturbance to the sitting bird than where inspection hatches are incorporated into the side of the box. This particular female was unsettled by the checking in previous years and because after the day of laying the second egg she remained inside the nest box when the aviary was entered we decided not to force her out. The first egg was laid on 5th August, and the second on the 7th August. When the box was next checked on the 20th August four eggs were present and on checking on the 21st August a chick had hatched. A second chick hatched on 22nd August and a third on the 23rd August. On the 26th August one of the chicks was found dead. The two remaining chicks seemed healthy but there was no sign of a fourth chick or unhatched egg. A second chick was found decomposed in the nest on the 1st September and the remaining chick fledged on the 8th October.

The above set of dates allows the calculation of incubation periods to finer limits than previously. If incubation began with the laying of the first egg on 5th August and this egg hatched on 21st August its incubation period was 16 days. This is the *maximum* estimate of the incubation period for this egg. If the second egg laid on the 7th August hatched on the 22nd August then its *maximum* incubation period was only 15 days. The exact dates of laying of the third and fourth egg were not determined but if as with the interval between the first two eggs they were laid on alternate days the incubation period for the third egg (assumed to be laid on 9th August and hatched on the 23rd) would be 14 days. However if this egg had been laid one day after the second on the 8th August its maximum incubation period as for the second egg would be 15 days. If the first egg had failed to hatch the incubation periods would be two days shorter than the above estimates. Such values would be so low that we can be reasonably confident that the first three eggs did hatch and our estimates for maximum incubation periods are in fact the true periods.

With respect to the calculation of the nestling period, assuming

the chick which survived was the first hatched, it remained in the nest for 48 days. This is longer than the nestling periods of 37 - 42 days estimated from previous observation and we suspect reflects the difficulties the female had in provisioning her chicks in 1991 as a result of the male's going out of breeding condition and losing interest in feeding her.

### **Greater Vasa Parrots.**

Greater Vasa Parrots were first obtained at Chester Zoo in 1985 and although eggs were laid in 1987, 1988 and 1989, this species was not successfully bred until 1990. Details of this first successful nesting were published in a previous issue of the Avicultural Magazine with the suggestion that the incubation period was around 18 days (Wilkinson 1990). The nestling period for the first chick hatched in 1990, assuming hatching on 10th June and known to fledge on 29th July, was estimated as 49 days. The nestling period for the second chick which also fledged on 29th July would be one or two days longer at 47 - 48 days.

Careful observations were made on the nesting Greater Vasa Parrots in 1991 with the result that exact laying dates and hatching dates were recorded for each of four eggs. Eggs were laid on 13th, 15th 17th and 19th May and hatched on 30th May, 1st, 3rd and 5th June. These gave exact incubation periods of 17 days for each egg. The first chick fledged on 17th July, the second on 18th July and the third and fourth together on the 20th July, giving nestling periods ranging between 48 days for the oldest chick and 45 days for the youngest. These observations are in close agreement with those recorded in 1990.

### **Summary**

Observations at nests of Lesser Vasa Parrots *Coracopsis nigra* at Chester Zoo indicate incubation periods of 14 - 16 days for each of three eggs, and nestling periods of 37 - 48 days. For the Greater Vasa Parrot *Coracopsis vasa* the incubation period for each of four eggs was recorded as 17 days and the nestling periods ranged from 45 - 49 days.

### **Acknowledgement**

We are grateful for the comments of Rosemary Low in assisting our interpretation of the 1991 nest records and for her encouragement in obtaining these data.

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## BREEDING THE RACKET-TAILED ROLLER

By Roger Cattermole (Diss)

The Racket-tailed Roller *Coracias spatulata* ranges over a large part of central Africa with the greatest concentrations being found in Tanzania, Zaire, Angola and Zambia. It is a bird of open woodland and spends most of its time below the tree canopy watching for the locusts, large beetles, scorpions, lizards etc. which form the bulk of its diet. In common with other Rollers the Racket-tailed has a very stunning display flight, flying vertically and then plunging earthwards with wings folded only to be opened when the bird is just feet above the ground. This highly specialised display flight enables the male to present the dazzling blues of the secondary feathers with the greatest effect as he banks out of the dive with fixed wings. Few data exist on the breeding biology of this species in the wild but natural hollows in trees some 6 to 7 metres above ground are known to provide its preferred nest sites.

Five individuals of the species were obtained during August 1990. They consisted of a surgically sexed pair and three of undetermined sex. The birds were purchased from two different sources but are likely to have been part of one consignment into the U.K. This species has apparently not previously been imported. Although they were not in juvenile plumage all of the specimens lacked the characteristic rackets and had many brown and grey feathers on their heads and necks. The body plumage was predominantly a pale powder blue and was not seen to change to any great extent when the birds obtained full breeding plumage. When first acquired all five birds were placed in a large outdoor aviary approximately 16 m x 8 m. Shelter was provided but rarely used. The members of the group were compatible and would roost sitting side by side in the highest point in the aviary. They settled in quickly and readily accepted a diet of minced ox heart, insectivorous diet, chick crumbs and mealworms all liberally sprinkled with multi-vitamins. The mealworms were taken with relish and all of the birds soon became quite confiding. Their eye-sight is quite remarkable and they take up vantage points to seek out every last mealworm trying to take cover in the grass of the aviary floor. The five birds attained full plumage by the middle of October, the long outer tail feathers taking some weeks to grow to their full extent. At this stage it became apparent that the outer tail feathers of the known male were noticeably longer than those of the surgically

sexed female. It may be reasonable to conclude that the length of these feathers may be used as a guide to the sex of the birds. Racket-tailed Rollers are certainly creatures of the sun and spend much of their time displaying to one another when the sun is shining. The display consists of much head bobbing and neck stretching with bills pointing vertically uttering excitedly loud, guttural cackling calls. This group display may suddenly be interrupted by frenzied flights around the aviary in a very haphazard manner with many near collisions.

The group was left outside until the end of November and the birds seemed unaffected by the cold but they disliked wet weather and looked very miserable on damp mornings. Their dry soft plumage almost seems to attract moisture and has no ability to shed water. They have never been observed bathing but they will wade quite happily into shallow water to retrieve mealworms. They rarely get wet when feeding in this manner for they walk almost on tiptoe and hold their tails high to avoid getting their plumage wet.

The winter quarters consisted of a greenhouse converted for wintering Pygmy geese in which a minimum temperature of 45° F. was maintained. The diet remained unchanged and all of the members of the group thrived. However the surgically sexed female was found dead in a pool one morning and it was presumed that it had been disturbed during the night and had fallen in. After this disaster, low intensity light was provided so that, if disturbed, the birds could see to return to a safe roost. Since the winter enclosure was a greenhouse periods of sun in the early spring (April) raised its temperature quite considerably. The Rollers enjoyed this and periods of display soon followed. Aggression towards one member of the group occurred and to avoid further stress to the individual it was decided to remove the known male and his believed choice of female. The pair was placed in the outside flight during the third week of April and two weeks later the remaining two birds were placed in an adjoining aviary. Much interaction took place between the two couples through the wire and the decision was taken to place all four birds in the same aviary. All four birds commenced a full moult shortly after being put outside. This may have been caused by the apparent shortening days which followed the twenty four hours of light which they experienced in their winter quarters. The complete moult lasted for several weeks with the outer tail feathers again being the last to develop.

The aviary contained various nest boxes designed primarily for

waterfowl. During early June the known male was frequently seen inspecting these including some that were at ground level. A hollow log fifteen inches deep with an internal diameter of approximately six inches and a natural entrance hole of two and a half inches was then fixed to an internal support three metres above the ground. A canopy of plywood one metre in diameter was placed above the nest box to provide shade and protection from the rain. The nest box was half filled with fine oak sawdust and a small dowel perch was fitted four centimetres below the entrance hole. It was only a matter of days before the male was seen investigating the box. He would frequently hang from the side of the box, just peering in, with outstretched wings and uttering excited chortling calls. Towards the end of July the male started to show signs of aggression towards two of the Rollers. The attacks invariably took place in flight and, because there was so much water in the aviary, it was decided to remove these two individuals. Other inhabitants of the aviary besides waterfowl and waders were Fairy Bluebirds, Royal Starlings and Red-tailed Laughing Thrushes to which no aggression was ever shown. Indeed they were even allowed in the immediate vicinity of the chosen nest site and a pair of Pygmy geese were seen on several occasions sitting on top of the nestbox and peering in even when the Rollers were incubating. Copulation was first observed on 27th July. The male would collect one or two mealworms and present these to the female. If she accepted, copulation was almost certain to follow. Copulation and attempted copulation was observed on numerous occasions. During early August the pair of Rollers were frequently observed calling and displaying and entering the chosen nestbox.

By the middle of August it was unusual for the female to feed herself. Virtually all of her food was presented to her by the ever attentive male. During the remaining days of August the female started to spend considerable amounts of time in the nestbox and the male frequently fed her from the entrance hole. The nestbox could not be inspected without removing it but it was presumed that eggs were laid during the last days of August. Incubation was believed to have started on 1st September. The female left the nestbox only occasionally and all of her food appeared to be provided by the male. On very hot days the female's head was often seen peering out of the entrance hole and as she often remained in this position for considerable lengths of time it was presumed that she was hanging from the inside of the box and letting the eggs cool. On the infrequent occasions when the female did leave the nestbox

the male would fly repeatedly around the aviary with very slow wing beats presenting the blue wing feathers with spectacular effect and screaming very loudly. He would continue displaying in this manner until the female returned to the nestbox. The male rarely sat near the nestbox but spent most of his time at various vantage points around the aviary watching for mealworms, which were collected and taken to the sitting female. During periods of rest the male frequently sat on a perch next to the adjoining aviary quietly chortling to the two Rollers previously removed from his aviary. During the evening of 20th September the male started to behave in a very agitated manner and it was believed that the eggs might have hatched. On the following morning this was confirmed when the male was seen to enter the nestbox with mealworms. Initial feeding was done by both the male and the female. However the male was considerably more attentive and carried far more of the food. By 5th October the pair were happy to leave the nest unattended while they were both feeding. At this stage greatly increased quantities of mealworms were provided to ensure that they were available at all times. Various other forms of live food were also provided but the regular mealworms were the definite favourites. The young were heard calling for the first time on 25th September as the adults approached the nestbox. In view of the rapidly shortening days and thanks to the advice of Andrew Perkins, a member of the Avicultural Society and successful breeder of softbills, artificial lighting was provided from 1 am to day-break to extend the feeding time available. Six one hundred watt lights fitted around the perimeter of the aviary and an overhead three hundred watt flood light provided a high light intensity. On inspection of the aviary on 5th October after dark, both adults were roosting. With the possibility of cold nights it was decided to provide twenty four hour lighting to enable the adults to feed around the clock. At this time it was also apparent that the female was rapidly losing interest and the male was doing virtually all of the feeding.

Presumably in their natural environment the young at this age are able to generate enough heat without the need of brooding. October nights in the U.K. can be quite cold and damp and the young could often be heard calling and sounded distressed but this did not tempt the adults to continue to brood. Is it possible that the duration of brooding is determined by instinct as opposed to the ability of the adult to determine the need from the behaviour of the young? I am convinced that at the time the adults stopped brooding

the young still required it in our climate.

The head of one youngster was seen at the entrance hole for the first time on 16th October. During the next few days one head was almost always visible and sometimes two. At this stage the adults rarely went into the nestbox and most of the feeding took place at the entrance hole. Both adults started spending more time sitting short distances from the nest and calling possibly trying to tempt the young to leave the nest. On 20th October the young seemed particularly agitated and near the point of leaving the nest. Because of the cold weather and the number of dangers in the aviary, primarily caused by the large areas of water provided for the waterfowl, the decision was taken to remove the young and adults to an indoor flight. The nestbox was removed and on inspection there were three young, one of which was dead. The dead youngster was less than half the size of its siblings but was showing virtually no signs of decomposition and so it was considered that it had died very recently. Presumably being a weaker youngster it was not able to get to the entrance hole for feeding and died of neglect. The two remaining young were fully feathered and their flight feathers were nearly complete. However, the tail feathers were little more than an inch long and obviously still in the early stages of growth. The plumage was a very dull blue grey with white and cream highlights. At this stage the young were approximately two thirds of the size of the adults. Following the transfer to the indoor flight the young were removed from the nestbox for a short time each evening and offered by hand two or three very large mealworms which were eagerly accepted. When held near the entrance to the nestbox the young would eagerly return. By early November the young left the nestbox of their own accord each morning but would still happily return in the evening if held near the entrance hole. On 6th November the young were roosting beside their parents. By the middle of November they were readily feeding on mealworms of their own accord.

Now (late December) the members of the family group are still compatible. The young are still not as big as their parents but have started to moult their breast feathers. New feathers seem to be the same colour as in the adults but are lacking its intensity. This suggests that full adult plumage is not attained until the third moult.

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This is probably the first successful breeding of the Racket-tailed Roller in this country. Anyone who knows of a previous breeding is asked to inform the Hon. Secretary.

## TINAMOUS IN GREAT BRITAIN

By Dr. Karl P. N. Shuker (West Bromwich)

To aviculturists, tinamous are well-known for being those non-descript, deceptively gallinaceous birds of the Neotropical Region that are in reality most closely related to certain of the giant, flightless ratites. Rather less well-known, conversely, is that at one time they seemed destined to become exotic new members of the English avifauna, as revealed in this article.

Tinamous are among the most perplexing and paradoxical of birds. Comprising some 40-odd species in total, and ranging in size from 8 - 21 inches, they closely parallel the galliform gamebirds in outward morphology, with small head and somewhat long, slender neck, plump body and short tail, sturdy legs, and rounded wings. Admittedly, their bill is generally rather more slender, elongate, and curved at its tip, and the tail is often hidden by an uncommonly pronounced development of the rump feathers, but in overall appearance they could easily be mistaken for a mottle-plumaged guinea-fowl, grouse, or quail (depending upon the tinamou species in question). Even so, it would seem that their misleadingly gallinaceous morphology is a consequence of convergent evolution (i.e. tinamous filling the ecological niche in South and Central America occupied elsewhere by genuine galliform species, but having arisen from a wholly separate ancestral avian stock), because detailed analyses not only of their skeletal structure but also of their egg-white proteins and (especially) their DNA have all indicated that their nearest relatives are actually the ostrich-like rheas!

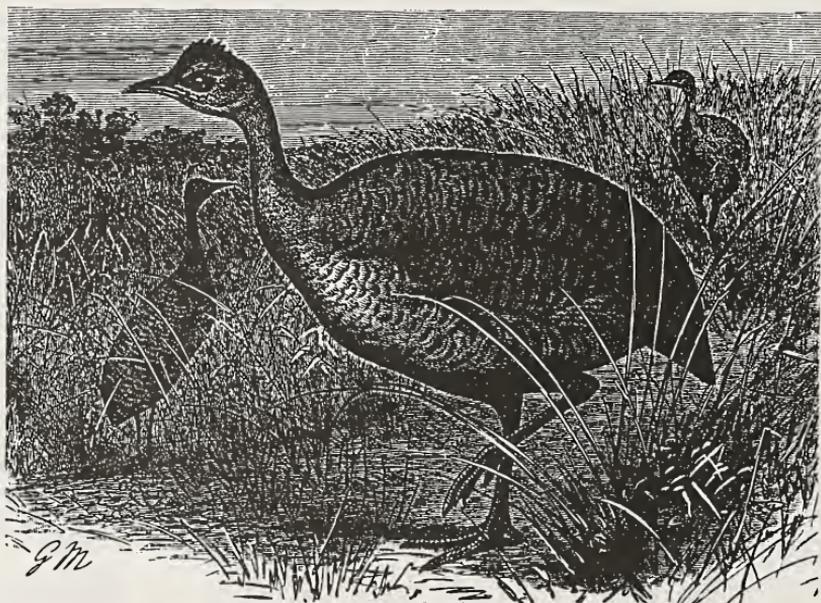
Nonetheless, the tinamous are nowadays classed within an entire taxonomic order of their own, *Tinamiformes*, because in spite of their ratite affinities they have a well-developed keel on their breast-bone for the attachment of flight muscles, and are indeed able to fly - though they are not particularly adept aerially, probably due to their notably small heart and lungs, which would seem to be insufficiently robust to power as energy-expensive an activity as flight. Equally paradoxical is the fact that although their legs are well constructed for running, tinamous are not noticeably successful at this mode of locomotion either, preferring to avoid danger by freezing motionless with head extended, their cryptic coloration affording good camouflage amidst their grassland and forest sur-

roundings.

Their outward appearance is not the only parallel between tinamous and galliform species. On account of the relative ease with which these intriguing birds can be bagged, in their native Neotropical homelands tinamous have always been very popular as gamebirds - a popularity enhanced by the tender and very tasty (if visually odd) nature of their almost transparent flesh. Accordingly, it could only be a matter of time before someone contemplated the idea of introducing one or more species of tinamou into Great Britain as novel additions of our country's list of gamebirds - a list already containing the names of several notable outsiders, including the Red-legged Partridge *Alectoris rufa* and the Common Pheasant *Phasianus colchicus*. The concept of establishing naturalised populations of tinamou in Great Britain was further favoured by the great ease with which these birds can be raised in captivity, enabling stocks for release into the wild to be built up very rapidly.

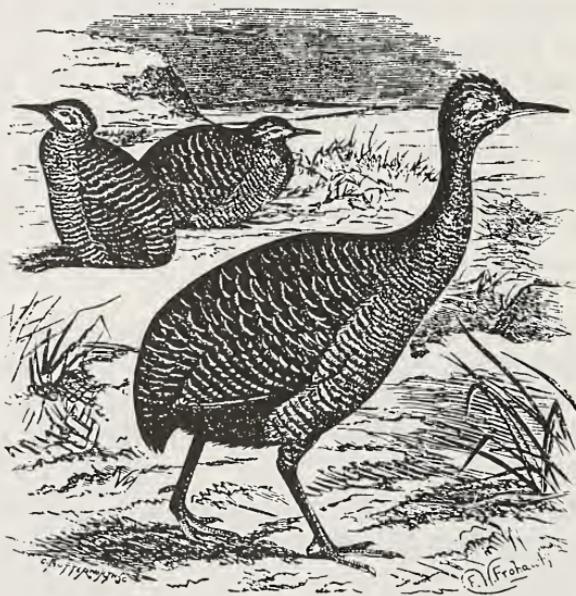
And so it was that in 1884 the scene was set for the commencement of this intriguing experiment in avian introduction - the brainchild of John Bateman, from Brightlingsea, Essex. The species that he had selected for this was *Rhynchotus rufescens*, the Rufous Tinamou - a 16 inch long, grassland-inhabiting form widely distributed in South America with a range extending from Brazil and Bolivia to Paraguay, Uruguay, and Argentina. In April 1883, he had obtained six specimens of this species from a friend, D. Shennan, of Negrete, Brazil, who had brought them to England from the River Plate three months earlier. Bateman maintained them in a low, wire-covered aviary with hay strewn over its floor, sited on one of his homesteads. By June, they had laid 30 eggs, most of which successfully hatched, and half of these survived to adulthood.

In January 1884, naturalist W. B. Tegetmeier paid Bateman a visit, and became very interested in his plans to release tinamous in England. On 23rd February 1884, *The Field* published a report by Tegetmeier regarding this. However, the first release had already occurred (albeit by accident), for during the summer of 1883 a retriever dog had broken through the wire-roof of Bateman's tinamou aviary, resulting in the death of four of the tinamous, and the escape of seven or eight of the others onto Bateman's estate and thence to the Brightlingsea marshes. Only a small number of tinamous had remained in captivity but these had increased to 13 by the time of Tegetmeier's visit. As for the escapees, Bateman



Rufous Tinamou *Rhynchotus rufescens*.

[From: LYDEKKER, R. (Ed.) (1894 - 6). *The Royal Natural History*. ]



Rufous Tinamou *Rhynchotus rufescens*.

[ From: NEWTON, A. & GADOW, H. (1894 - 6). *A Dictionary of Birds*. ]

recognised that they were in grave danger of being bagged by persons shooting in the area (thereby ending any chance that they would succeed in establishing a viable population), and so in a bid to thwart this he issued a handbill, drawing to the attention of local people the basic appearance and habits of tinamous, and his plans for their naturalisation in England. The handbill read:

The tinamou, or, as it is called by the English settlers on the River Plate, "Big Partridge", is a game bird, sticking almost entirely to the grass land; size, about that of a hen pheasant; colour when roasted, snowy white throughout. When flushed, he rises straight into the air with a jump, about 15 ft., and then flies off steadily for about half a mile; he will not rise more than twice. Mr. Bateman proposes, after crossing his stock with the tinamous in the Zoological Gardens, to turn them out on the Brightlingsea marshes, which are strikingly like the district whence they came, and he hopes that the gentlemen and sportsmen of Essex will give the experiment a chance of succeeding, by sparing this bird for the next few seasons, if they stray, as they are sure to do, into the neighbouring parishes, as they would supply a great sporting want in the marshland districts.

To supplement his captive stock, following Tegetmeier's visit Bateman obtained three more specimens of Rufous Tinamou from his friend Shennan, and also purchased three from London Zoo. In April 1885, he released eleven individuals onto the Brightlingsea marshes; these, together with 14 hatched from eggs, had increased to approximately 50 or 60 birds by September, according to a second, more extensive report by Tegetmeier (*The Field*, 12th September 1885).

Tegetmeier noted that throughout spring and early summer in Brightlingsea and parts of Thorington the Rufous Tinamou's presence there could be readily confirmed by its very distinctive call, described as a musical 'ti-a-ú-ú-ú' in the case of the cock bird, and sounding unexpectedly similar to that of the Blackbird *Turdus merula*. Illustrating this similarity is an entertaining anecdote contained in a letter to Tegetmeier from Bateman:

Mr. Bateman, in his letter to me, states: "A passing gipsy bird-fancier hailed my keeper's wife, after listening attentively awhile, with 'That's an uncommon fine blackbird you've got there, missus,' alluding to the note. 'Yes,' she replied. 'Will you take five bob for him, missus?' 'No; I won't.' 'May I have a look?' 'Yes; ye may.' 'Well I'm

blowed!" As he well might be, seeing what he regarded as the note of a Blackbird proceeding from a bird as large as a hen Pheasant.

Summing up his report of 12 September 1885, Tegetmeier offered the following words of optimism:

I cannot conclude without congratulating Mr. Bateman on the success of the experiment as far as it has yet proceeded. So much harm has ben done by indiscriminate and thoughtless acclimatisation, that it is satisfactory to hear that one useful bird has a chance of being introduced under conditions in which other game birds are not likely to do well.

Of course, even if the threat to the tinamous' establishment from shooters could be prevented, there remained the problem of persecution from four-legged predators - most especially the fox, a major hunter of tinamous in their native New World homelands. Yet in his second report, Tegetmeier had dismissed the possibility that foxes would be a danger to them in England:

... there is no doubt that an English fox would not object to a bird that is as delicate eating as a Landrail [Corncrake *Crex crex*]. The young brood in Brightlingsea are, however, spared that danger, as the M.F.H. of the Essex and Suffolk hounds has, with that courtesy which always distinguishes the true sportsman, granted a dispensation for the season from litters of cubs in the parish.

Tragically, however, Tegetmeier's expectation was not fulfilled. Despite all precautions, the foxes triumphed very shortly afterwards, and the tinamous were exterminated. In less than a decade Bateman's hopes for a resident species of tinamou in Britain had been promisingly born, had temporarily flourished, and had been utterly destroyed. By 1896, the entire episode had been relegated to no more than the briefest of mentions in the leading ornithological work of that time. Quoting from *A Dictionary of Birds* by Prof. Alfred Newton and Hans Gadow:

What would have been a successful attempt by Mr. John Bateman to naturalize this species, *Rhynchotus rufescens*, in England, at Brightlingsea in Essex ... unfortunately failed owing to the destruction of the birds by foxes.

A unique chapter in British aviculture was closed - or was it? In his definitive work *Introduced Birds of the World* (1981), zoologist John L. Long states:

It seems likely that a number of tinamous, other than the Rufous Tinamou, may have been introduced into Great

Britain, but these attempts appear to be poorly documented.

An event that may have ensued from one such attempt featured a tinamou far from the Brightlingsea area, but sadly the precise identity of that bird is very much a matter for conjecture. On 20th January 1900, *The Field* published the following letter from J. C. Hawkshaw of Hollycombe, Liphook, Hants:

On Dec. 23 last, while shooting a covert on this estate, a strange bird got up amongst the pheasants and was shot. On examination it proved to be a Great Tinamu, or, as it is sometimes called, martineta. As Christmas was near, I skinned it myself, with a view of preserving it until I could send it to be set up, and found it to be in excellent condition, with its crop full of Indian corn, which it had evidently picked up in the covert, where the pheasants were regularly fed. The keeper on whose beat it was killed said that he had constantly seen it feeding with the pheasants. If you would be kind enough to insert the above in your columns I hope that I may be able to discover whence this stranger had strayed.

As a footnote to that letter, the editors of *The Field* briefly referred to Bateman's experiment at Brightlingsea, but confessed that they were unaware of any similar trials in Surrey, Sussex, or Hants (Liphook was sited on the confines of those three counties) that might explain the origin of the specimen reported by Hawkshaw.

Not only was this tinamou's origin a mystery, so too was its identity. No description of its appearance was given; the only clues to its species are the two common names, 'great tinamu' and 'martineta', applied to it by Hawkshaw. Ironically, however, these actually serve only to confuse the matter further, rather than to clarify it. The problem is that they have been variously applied to at least three completely different species. Both names have been applied to the Rufous Tinamou (as in Dr. Richard Lydekker's *The Royal Natural History*, 1894 - 6); but 'great tinamou' is also commonly used in relation to a slightly larger species, *Tinamus major* (native to northwestern and central South America, as well as Central America); and 'martineta' doubles as an alternative name for the Elegant Tinamou *Eudromia elegans* (inhabiting Chile and southern Argentina).

Was Hawkshaw's bird proof, therefore, of another attempt to introduce the Rufous Tinamou into Britain; or was it evidence of a comparable experiment with a different species? Perhaps its existence in the wild was wholly accidental, totally unplanned -

simply a lone escapee from some aviary - certainly, tinamous had been maintained in captivity in Britain, with *no* attempt made to release them for naturalisation purposes, by a number of different aviculturists for many years before this event.

Today, even with such established exotica as flocks of Ring-necked Parakeets *Psittacula krameri* flitting through many parts of southeastern England, Red-necked Wallabies *Macropus rufogriseus* hopping across the Peak District moorlands, and Golden Pheasants *Chrysolophus pictus* strutting regally through forest glades in widely dispersed areas of the U.K., it still seems strange to consider that had it not been for an all-too-formidable onslaught by the foxes of Brightlingsea a hundred years ago, Great Britain may well have become home to an entire additional order of birds - that short-legged relatives of rheas and ostriches would have become a common sight by now in the fields and marshlands of England, far removed indeed from their original Neotropical world.

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## THE JACQUOT EXPRESS

By Paul Butler and Judith Venning (Hayle)

Last winter a new project was being 'hatched' at Paradise Park, the centre for endangered birds in Hayle, Cornwall. After several weeks of activity an ugly duckling in the shape of a second hand British Leyland bus was turned into a swan, or more accurately a parrot!

The World Parrot Trust was asked by the RARE centre in the USA to supply a mobile interpretive centre for the islanders of St. Lucia in the Caribbean. This would tour the local communities and carry the conservation message in a lively and attention-getting format.

The Trust set to work, appealed to its members, raised £14,000 and produced the most colourful travelling classroom you are likely to encounter. The exterior of the bus is painted in bright colours which depict the endangered St. Lucia parrot 'Jacquot' against the background of a rainforest. Jacquot is the national symbol of the island and has become the focus for conservation efforts as its natural habitat declines.

The interior of the Jacquot Express has been fitted with interactive displays which highlight the environmental problems on the island. Some items of equipment and voluntary assistance were given by local firms in Cornwall, England and by British Airways Assisting Conservation. Gradually the exhibitions and models were assembled. The bus contains the following exhibits:-

### 1. Putting the Pieces in Place.

This environmental jigsaw illustrates the forest ecosystem with each piece representing a single component such as the sun, trees, river, snake or bird. The exhibit explains that in nature all the pieces are connected and that if one is removed the whole picture is destroyed. The puzzle's pieces are large and colourful catching the eye of even the bus's youngest visitor.

### 2. Forests for People.

This exhibit describes the functions that trees serve with regard to the production of timber and the conservation of precious soil and water resources. Visitors are invited to write down (using chalk and a blackboard) all the various uses of wood and water.

3. Proud of my Parrot.

This photo display highlights one of the most important denizens of the island's forest ecosystem - the St. Lucia Parrot, *Amazona versicolor*, known locally as Jacquot. The panel highlights its beauty, uniqueness and rarity as well as its symbolic value as the country's National Bird. Information on its feeding, breeding habits and status are given and a plea made for the public's continuing support in its conservation.

4. Mirror, Mirror on the Wall.

The use of a mirror shows the visitor who threatens the forest most and whose responsibility it is to ensure its protection!

5. The Population Problem.

This interactive display lights up at the press of a button correlating the decline of St. Lucia's forest resource with the island's rapidly growing population and poses the question "What will remain in the year 2000?"

6. Not a Drop to Drink.

Perhaps the highlight of the bus is two exhibits that illustrate the effects of deforestation. Constructed at a cost of US \$8000 these show a forested watershed and compare it with one under poor management. The press of a button starts a process where rains fall on the mountainside, percolates down into the river and flows out of the model into a glass. The water in the "well managed model" arrives clean and can be drunk. The water from the model that depicts hillsides ravaged by deforestation produces a muddy coloured water supply which looks far from being good to drink.

7. Forests in the Future.

The final display is a photo panel which details what is being done to protect the forest and what the individual can do to help. The bus is also equipped with a generator, slide projector, VCR and television, as well as cassette recorders to provide supplementary information and a PA system to hail passers by. Discovery boxes, posters and handouts complete the facility.

Jacquot Express was handed over to the Forestry Department at a small ceremony on 4th April. Present at the event were Mr. Ferdinand Henry, Minister of Agriculture; his Permanent Secretary, Mr. Losmos Richardson; Chief Forestry Officer Brian James and a number of invited guests. Also present were David Woolcock, Programme Director for the World Parrot Trust, Paul Butler from

the RARE Centre and U.S. actor Lou Gossett Junior.

At the ceremony Mr. Butler indicated that through the bus the Forestry Department's environmental message could be carried island wide. He added that when the bus eventually breaks down, hopefully after giving years of service, it can be towed to a prominent location to serve as a fixed educational facility. By that time, everyone will be familiar with the bus and likely to seek it out to learn more. Mr. Butler added that space on the back is available for rent to businesses which wish to add their own support to the scheme.

By the second week in April Jacquot Express was on the road. Its effect on the population was stunning. Open mouths, looks of disbelief followed by radiant smiles greeted the bus wherever it went. Since then it has travelled to communities in the north and east of the island giving children and adults alike an opportunity to tour the exhibits and to learn about the importance of the forest. In late April the bus visited the town of Micaud where more than 350 farmers were shown its displays thereby carrying the conservation message into the heart of the agricultural community.

Under the direction of Senior Education Officer, Anita James, a travel schedule has been prepared and it is anticipated that over the next 6 - 8 months the bus will visit every major community on Saint Lucia. After making this initial round, its exhibits will be removed and housed in the department's interpretive facility. New exhibits will be designed and constructed so that the bus may revisit Saint Lucia's towns and villages carrying a fresh environmental message.

Following the success of the Jacquot Express, the World Parrot Trust is now equipping a second interpretive centre for the island of Dominica. For further information about this article please contact David Woolcock or Judith Venning at The World Parrot Trust, Glanmor House, Hayle TR27 4HY, U.K.. Telephone 0736-753365, Fax 0736-756438.

\* \* \*

This interesting article describes just one example of the work which is being done by the World Parrot Trust to support conservation measures for parrots. The Trust's efforts to protect parrots in the wild include the education of the general public and the protection and preservation of natural habitats. It advocates controls on international trade in wild caught parrots but it recognises

the importance of aviculture in conservation and encourages avicultural activities of the highest standard to create and sustain populations of endangered species. It also supports veterinary and genetic studies. The Trust has been in operation for two years and has already provided generous financial and practical support to prevent the disappearance for ever of many endangered species including the Red-tailed Black Cockatoo in Victoria, Spix's and Hyacinthine Macaws in Brazil, the St. Lucia Parrot in the Caribbean, the Moluccan and other species of cockatoo in Indonesia, the Echo Parrakeet in Mauritius and the Maroon-fronted Parrot in Mexico. The Trust was created mainly as a result of the enthusiasm, dedication and hard work of Michael Reynolds.

Ed.

\* \* \*

## NEWS AND VIEWS

In 1989 the pair of Spix's Macaw at Loro Parque, Teneriffe produced a single egg which was subsequently broken. The pair has not nested since then. About twenty thousand pounds, raised by Loro Parque at the last World Parrot Convention, will be used for field work in Brazil in the area where the last known wild bird of this species survives. A captive bird will be housed in an enclosure into which it is hoped the wild bird may be enticed to breed. If this happens the birds will remain at semi-liberty which should facilitate the release of any offspring. (What rare optimism in conservationists!)

\* \* \*

Huge flocks of Little Corellas (Bare-eyed Cockatoos) have been wreaking havoc in Broken Hill, New South Wales by causing frequent blackouts by chewing through the insulators at the Electricity Company's sub-station.

\* \* \*

Sherbrooke Council, Victoria, Australia proposes to introduce a law to compel cat owners to lock up their cats at night. Such a measure should help to save Lyrebirds which are coming under severe pressure from predation by cats and foxes as well as from habitat destruction. It would also be greatly appreciated by local aviculturists.

\* \* \*

The Parrot Society celebrated its twenty fifth anniversary at the United Kingdom Parrot Conference held at Chester in November. One of the papers was delivered by our Council Member David Alderton. After giving a very clear account of the ways in which CITES regulates trade in rare species threatened with extinction, he recommended the introduction of a ban on the sale of endangered species like Hyacinthine Macaws and Queen of Bavaria's Conures as pets. He suggested that, if aviculture were to make a positive contribution to conservation, such species should be available to approved breeders only. His remarks must have upset some of the members of his audience (presumably the more commercially orientated) and he was asked to leave the meeting. What hypocrites some of us are!

\* \* \*

In 1991 seven Congo Peacocks were reared at Amsterdam Zoo and two Streak-bellied Woodpeckers *Picoides macei* at Carl Hagenbeck's Tierpark, Hamburg - probably a world first breeding in captivity.

\* \* \*

"Euro Parrot 1992" will take place from 14th to 16th May in Odense, Denmark. Speakers will include Joseph Forshaw and Tony Silva. Further information is obtainable from Euro Parrot 1992, Odense Tourist Association, Town Hall, 5000 Odense 6, Denmark.

\* \* \*

A conference on Hornbills sponsored by the World Conservation Union, the International Council for Bird Preservation and the American Association of Zoological Parks and Aquaria was recently held in Singapore. Delegates learned that the populations of almost all of the 53 species of Asian Hornbill are declining rapidly as a result of deforestation. Hornbills nest in large Dipterocarps which are disappearing through intensive logging at an alarming rate. Conservation through aviculture seems hopeless since there are few pairs in Zoos or private collections and, in any case, Zoos cannot or are not willing to devote sufficient space for them to breed. Among the species most affected are the Rhinoceros Hornbill and the even more rare Narcondam Hornbill. Attempts at conservation, involving the construction of artificial tree trunks for

nesting, the setting up of management and population studies and the introduction of captive breeding schemes, are being made but they all seem too late.

\* \* \*

Members, attending regularly the President's Annual Garden Party at Chestnut Lodge may remember seeing, a few years ago, Raymond Sawyer's beautiful Green Junglefowl which bred successfully in his care. There now appears to be very few of these lovely birds in captivity in the United Kingdom, although it is rumoured that a few have been imported recently. Green Junglefowl, which are closely related to the Red Junglefowl (from which domestic poultry have been derived), are becoming increasingly rare because the wild population is being seriously reduced to produce "Bekisars". These are sterile hybrids between Green Junglefowl and domestic poultry. They have been favourite cage birds in Indonesia for a long time because they are used to take part in the traditional song contests. Recently Bekisars have become the faunal mascot of one of the Provinces of Java and now everybody wants to possess them with a consequent inevitable reduction of the wild population of Green Junglefowl. The World Pheasant Association is already making efforts, which one hopes will be successful, to ensure their survival.

\* \* \*

Dulcie Cooke has drawn my attention to the following interesting letter from Mrs. H. B. Cave of Kington, Hereford which appeared in the Daily Telegraph, 14th January 1992 under the heading "Alarmist tendency in owl appeal".

"The £380,000 appeal by the Royal Society for the Protection of Birds to save the Barn Owl (report, Jan.10) is yet another instance of alarmist conservationists being "economical with the truth" and using an attractive bird to obtain money.

The RSPB states that there are only 5,000 pairs left - but this is just in Britain. The Barn Owl is the most widespread landbird in the world, found across North and South America, Africa, Europe, South-East Asia and Australasia. Britain comprises just one third of one per cent of its range. This bird is a long way from extinction; even the over-used "threatened" is hardly applicable.

The Osprey was another emblem used by conservationists, yet it is easily the commonest large bird of prey in the world. The 50 or so pairs found in Scotland have attracted hundred of thousands of pounds over the past two decades, but the fact that as many birds have been counted in one tree in Canada is never mentioned.

It is clear that to attract some of the £100 million a year currently available to major nature conservation bodies in Britain, a species has to be "marketable" by way of endless appeals, expensive advertising and the inevitable junk mail. Meanwhile those habitats and species for which Britain is important in world terms are all in rapid decline.

As someone who works full-time in nature conservation, I hope that the new decade at least reverses the trends of the last one and brings a better use of resources to our countryside."

\* \* \*

A census of Touracos in Britain is being carried out as part of the Foreign Bird Federation initiative to establish specialist groups and breeding programmes for particular groups of birds. The aim is to establish the numbers of adult birds kept and young reared in 1991 for each species. These figures will be published in a report to be sent to all contributors. A further aim is to help breeders seeking to pair single birds or place or obtain surplus birds by putting them in touch with each other (by request only: the report will not include contributors' names or addresses). The census will be the first step in establishing a network of Touraco breeders, identifying species which are low in numbers, difficult to breed, or for which studbooks might be useful, and identifying other areas in which Touraco keepers can usefully cooperate. Touracos are ideal candidates for the establishment of sustainable captive populations and it is hoped that all keepers will respond to the census. The census is organised by Jim Irwin-Davis, curator of Harewood Bird Garden, and Touraco breeders Nigel Hewston, Andrew Perkins and Françoise Raison. Touraco keepers who have not received a form should write to Jim Irwin-Davis, the Bird Garden, Harewood, Leeds LS17 9LF for a form and further details.

\* \* \*

The habitat of Edward's Pheasant has virtually been destroyed as a result of the Vietnam war and the species may be just another example of the great variety of birds which have recently become extinct in the wild. There are still a few specimens in aviaries throughout the world. These are the descendants of fourteen specimens which Jean Delacour collected in 1924. The survival plan for the species will depend upon their progeny and will undoubtedly be helped by the co-operation of pheasant keepers in contributing to the census organised by the World Pheasant Association. (Census co-ordinator Diane Hewitt, Windy Hall, Crook Road, Windermere, Cumbria.)

\* \* \*

In the Loro Parque Newsletter No 25 Tony Silva discusses the problems affecting aviculturists which have arisen as a result of the decision of air-lines to refuse to transport not only wild caught but also aviary bred birds. He concludes that the consequent genetic isolation of populations of endangered species will adversely affect conservation programmes. At the park several species of Parrot bred successfully for the first time in 1991. These include Bernstein's Lory, the Blue-fronted Amazon Parrot, Bodin's Amazon, Queen of Bavaria's Conure, the Fiery-shouldered Conure, the Greater Vasa Parrot, Leadbeater's Cockatoo and the Orange-breasted Fig Parrot. Chilean Flamingoes and Demoiselle Cranes were also reared. The newsletter concludes with Tony Silva's account of his visit to Cape York to observe the Golden-shouldered Parrot and to study the reasons for its decline in the wild. Predation by cats and possibly Cane Toads and illegal trapping, he considers, are not the only reasons and recommends that a detailed field study should be embarked upon by the Loro Parque Association.

Ed.

\* \* \*



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*David Hosking*

Von der Decken's Hornbill *Tockus deckeni*

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## BREEDING THE VON DER DECKEN'S HORNBILL AT LEEDS CASTLE, MAIDSTONE, KENT IN 1990

By Laura Paterson (Head Keeper)

The Von der Decken's Hornbill *Tockus deckeni* is one of the smaller species of hornbill, being only 17 - 20 inches in length and approximately 130 g in weight. They are mainly arboreal, belonging to the sub-family *Bucerotinae* and closely resemble the Jackson's Hornbill. They are white breasted with black wings but lack the white spotted wing coverts of the Jackson's Hornbill. The feathers around the eyes are black as is a streak running from the bill to the back of the head. The legs and feet are also black. The male of this species has a large, curved bill which is bright red in colour turning to white at the tip (but does not have a casque) whereas the female who is smaller in body size has a smaller bill which is less thick than the male's and all black in colour. This species of hornbill inhabits central Ethiopia and southern Somalia to central Tanzania and is said to be locally common. It's favourite habitat is dry bush country and open Acacia woodland where it can feed on a varied diet of fruits, berries, insects, lizards and even small mammals such as bats.

Rarely seen in zoos and private collections, the Von der Decken's Hornbill is gregarious in nature and can be housed quite amicably with smaller softbills such as thrushes and starlings. We feed our hornbills on a diet which includes apples, pears, bananas, grapes, papaya, insectivorous mix, crushed diet A (SDS Diets), minced ox heart, rat pinkies, and a seasonal variety of livefood such as mealworms, morio worms and locusts, which the birds take directly from the hand.

Our hornbills are housed with a breeding pair of Spreeo Starlings in a planted aviary made of metal framed mesh panels with a smaller brick built shelter for the birds privacy and warmth during the winter months. At such times heat can be supplied to these

shelters and lights are on timers to provide longer feeding hours. The outside flight is roofed by a metal canopy approximately 17 feet high to imitate tree top shelter and the most exposed side of the aviary is sheltered by a thick growth of Honeysuckle. In this way the birds are protected from the worst of the weather, and if necessary can be completely shut inside. The presence of a second pair of Von der Decken's Hornbills which can be seen from the outside flight prompts territory displays and calling and serves to strengthen pair bonds.

In early March several nest boxes were provided both in the flight and inside the shelter. The box eventually chosen was one inside the shelter. It was the smallest box in the aviary and was originally intended for the Spreo Starlings. It was 18 inches deep, 9 inches square and had an entrance hole only 3 inches in diameter (just big enough for the female to squeeze through). In early April the male began offering food to the female which she accepted and much time was spent by the female examining all of the available nest boxes. During this period the male frequently displayed courtship behaviour which involved a repeated low call whilst lowering his head and stretching his wings upwards. However we did not observe the birds mating. The female spent approximately three weeks going in and out of each box and partially mudding up entrance holes before making the final choice. Although he showed interest in this activity the male seemed to leave the mudding up mostly to the female. However, once the female had decided where to make her nest the role of the male became all important.

The female commenced mudding up the nest box on 11th May, with the male in close attendance. On 15th May the female was nowhere to be seen. The nest box was mudded up except for a narrow slit. Even a one inch gap between the nest box and the wall was mudded up. The male continued carrying food to the nest box and defending the territory. Extra livefood was supplied including locusts twice a day, extra pinkies, mealworms and morios. Initially the male took all the livefood to the female but after a few days reduced the supply presumably because of her confinement.

On 16th May the Spreo Starlings and their newly fledged young were removed from the aviary. On 5th June it was noticed that the male was no longer taking locusts to the female, but on 17th the female was seen peering through the slit in the mud and young were heard in the nest. At this point the female had been in the nest box for 34 days.

From then on the supply of livefood was increased and all

locusts offered were taken straight to the nest box by the male. On 14th July, 28 days after the young were first heard in the nest, the female left the nest box. She was in perfect feather and had obviously moulted completely in the nest. Immediately the male began calling and displaying to and feeding her and she kept close to him for all that morning. On 14th July two youngsters were seen looking out of the nest. When locusts were offered the male fed the young and then the female. Three weeks later the youngsters left the nest looking just like the female but with blue eyes. Both young were fully feathered. This was 50 days after first being heard in the nest box. Locusts and lots of livefood continued to be supplied and the parents continued to feed the young. An additional food dish was provided in the outside flight to encourage the young to eat on their own, which they began to do within a couple of days. Seven days after leaving the nest, one youngster was found dead on the floor of the flight although there were no signs of injury or ill-health and a post-mortem investigation could not determine the cause of death. The remaining youngster remained with the parents until 2nd September when the female was seen chasing him off and going in and out of the original nest box. The parent birds were seen copulating later the same day. The youngster was removed from the aviary.

On 3rd September the female was back in the box again with the male carrying food to her. On 22nd November one youngster left the nest box, 50 days after all the locusts supplied were taken to the nest box, i.e. 50 days after the assumed date of hatching (4th October 1990). On 26th November a second youngster left the nest box. Both birds were in immaculate feather. On 1st December a third youngster emerged to our surprise as no sound had been heard from the box after the second chick had left it. The third youngster, unlike any of the others, returned to the nest box at night, perhaps because of the weather (it was now December) and the fact that he was the youngest of the clutch. All the young from the second clutch were reared successfully by the parents. We believe this to be a first breeding of this species under controlled conditions in the U.K.

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This is probably the first successful breeding of the Von der Decken's Hornbill in this country. Anyone who knows of a previous breeding in the U.K. is asked to inform the Hon. Secretary.

## BREEDING THE RED THROATED CONURE

By Shirley Lawton (Northampton)

The Red-throated Conure *Aratinga holochlora rubritorquis* is a most attractive bird which has, perhaps, been undeservedly overlooked by many people who keep Conures because of the rather uninspiring plain green colour of the nominate race *Aratinga holochlora holochlora*. This is a great pity for my husband and I have found the subspecies *rubritorquis* to be a colourful and thoroughly interesting addition to our collection.

According to Forshaw (Parrots of the World) there are four races of the Green Conure inhabiting southern Mexico, Eastern Guatemala, El Salvador and Honduras. *Aratinga holochlora rubritorquis* has been found in the highlands of eastern Guatemala, in El Salvador, in Honduras and in northern Nicaragua. Deciduous woodlands, watercourses margined by trees, scrublands, the margins of forests and the lower parts of highland regions up to 2000 m provide their habitat. The race *rubritorquis* is fairly common in Honduras where it inhabits pine forests above 900 m when breeding, coming down to 300 m in the non breeding season. In their wild state these birds fly about in large noisy flocks in search of food. Their flight is high, direct and very swift. They eat seeds, fruits, nuts and berries. They will raid corn crops and are fond of the ripe fruits of the Waxberry, *Myrica mexicana*.

The Green Conures appear to be opportunistic in their choice of nesting sites. They have been recorded nesting in crevices in a cave in eastern Mexico. In El Salvador pairs have been seen making holes in Termites' mounds, and entering and leaving Woodpecker's holes. One bird was noticed entering a hole in a large Cypress tree in Mexico.

According to Rosemary Low (Parrots Their Care and Breeding) the race *rubritorquis* was virtually unknown in aviculture until the 1970s. Thomas Arndt recorded the first breeding in West Germany in 1976. He stated that once they are used to their keeper Red-throated Conures become quite tame. His pair soon lost their shyness and accepted titbits from the hand. However, when breeding they became very aggressive. They were given fresh twigs for gnawing at all times and as they became tame they raised their loud voices less often. In Vogelpark, Walsrode, Germany, the Red-throated Conure, *rubritorquis*, was reared in 1979. In 1982,

Ramon Noegel and Greg Moss bred *rubritorquis* for the first time in the U.S.A. Ramon Noegel wrote (Watchbird, March 1986) that two pairs nested, the young taking 21 days to hatch. In the Florida climate it might be expected that chicks would hatch slightly earlier than in a cold climate. The chicks were removed from the nest for hand rearing when they were fully feathered. Unlike wild caught youngsters, the three chicks developed red on their throats immediately. He considers that the addition of carotene and fish oil to the diet causes captive bred young to develop their colours more rapidly than wild caught specimens. He also mentions a visit to Central America in 1979 when he and Greg Moss discovered *rubritorquis* nesting in extinct volcanoes in southern Honduras.

Like the nominate race *Aratinga holochlora rubritorquis* is a mainly green Conure. In adult birds the throat and upper breast are bright orange-red and this colour increases in area with age. The eye ring is flesh coloured, the iris is red, the beak is horn coloured and the feet are brown. The length of an adult bird is 32 cm.

In 1988 we obtained a number of Red-throated Conures immediately after quarantine. They were mostly youngsters, all quite tame, having been taken from the nests and hand reared in Honduras, their country of origin. Some of them showed no red at all on their throats for when they fledge they are entirely green, as are the Red Masked *Aratinga erythrogenys*. The hen of the pair which subsequently bred for us had quite a lot of red on her throat and was obviously older than the male. Since we acquired them the red has become quite extensive and they are now very beautiful birds.

The birds were housed in a circular aviary divided into six triangular flights. These aviaries seem to suit the birds which find security at the narrow end at the rear of the flight. Nest boxes, in which conures like to roost at night are always available. The measurements of the box given to the breeding pair of Red-throated Conures are 18" high by 9" square (46 cm x 23 cm). The floors of the flights are grass.

At the beginning of July 1991 the hen of the pair showed a lot of interest in the nest box and on 21st July she laid her first egg which was followed by another two days later. Incubation, I estimate, took 24 days but I did not disturb the hen until after both chicks had hatched. The parents proved to be most attentive to their young. The first chick left the nest on 5th October and on the following day both chicks were out in the flight. They were left with their parents for a further three weeks by which time they were feeding themselves without help from the parents. It was now the

end of October, the nights were chilly and so it was decided to transfer the two young birds to a place where a little heat could be provided. Once they had left the nest the young birds never returned of their own accord to the box at night and it had been necessary to "persuade" them to return to the parent's box each night since fledging. The parents were tolerant of the young birds but it was obviously better for them to be in an enclosure which was warm at night. When the young birds were already quite well developed, but still in the nest, they were seen by Freddie and Dulcie Cooke, who remarked on how well the parents were caring for them.

The feeding of these Conures could not have been more easy. They were given their normal diet but in larger quantities. This consists of Sunflower seeds, Safflower seeds, oats, millet, a variety of fruits and vegetable, sweet corn, mixed pulses (soaked) and a small quantity of "Sheep mix". Like most *Aratinga* Conures the sexes of these birds are alike and so, at some future date, it will be necessary for them to be sexed.

My husband and I have found these very attractive and steady birds most rewarding to keep and breed and deserving of the care and attention bestowed upon them.

\* \* \*

This is probably the first successful breeding of the Red-throated Conure in this country. Anyone who knows of a previous breeding in the U.K. of any race of the species *Aratinga holochlora* is asked to inform the Hon. Secretary

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**OBSERVATIONS ON THE GREY-HEADED  
MANNIKIN *LONGHURA CANICEPS* AND THE  
CHESTNUT-BREADED MANNIKIN *LONGHURA  
CASTANEOOTHORAX* IN THE PORT MORESBY  
AREA.**

By Robin L. Restall (Hong Kong)

In July, 1990, I visited Port Moresby accompanied by my wife. The express purpose of the visit was to observe the local mannikins *Lonchura* spp in the field, and make detailed examinations of individuals in the hand including painting accurate colour references of each plumage phase if possible. After some interesting adventures, including escaping from a gang of rascals in the Morata township when our car was attacked and we narrowly avoided being murdered [we were attempting a sortie to the Waigani marshes], we met up with Roger and Jennie Hicks of the Port Moresby Birdwatching Club. Thanks entirely to the good nature and extreme helpfulness of the Hicks our objectives were achieved.

We visited several locations around Port Moresby, including a drive past Sogeri. Thanks to the kind service of Mr. and Mrs. Tolworth of the Pacific Adventist College, we were able to set a mist net in a perfect location on two mornings and caught several birds of both local species. On the first day, upon catching 12 birds we closed down the net. These were banded with official AOH rings, recorded by Roger, and carefully detailed by me. I retained four Grey-heads for painting. On the second day some 27 birds entered the net almost immediately and I had to make special efforts to prevent others from becoming trapped. We closed the net at once, From these I retained five birds for painting. All the birds were subsequently released in the location in which they had been netted during the previous day. The following notes are derived from a combination of field observations and study of the captive birds.

**GREY-HEADED MANNIKIN -**

*Lonchura caniceps*

This is the darkest and most richly coloured of the various races

of this species. Two of the others, *kumusii* from the northern lowlands and *scratchleyana* of mid-montane levels, are both more pallid in every sense. There are almost certainly other races, hitherto not recognised, that I will describe in another paper, and which are detailed in my book on *Munias* (Restall, 1992, in *litt.*)

Adult males measured 110 mm in length with wings invariably 52 mm. The orange of the rump begins at the level of the first tertiary and is flushed with yellow there. The underwing-coverts are pure buffish-salmon. Adult females measured 105 mm with the wings 48 mm. The orange of the rump begins irregularly [it may be scalloped with the dark brown] at the level of the third tertiary and is both lacking the yellowish flush, and the uppertail-coverts are not quite so brilliant. With a quantity of full adults to choose from in the hand it is comparatively easy to select males and females, though no doubt a fair proportion would have to be classed as uncertain. The orange uppertail-coverts are undoubtedly used as a social signal in breeding behaviour for the long hair-like, or splayed ends are full and show down below the wing tips at the side of the body. They are quite noticeable when a bird, particularly a male, flies up to a vertical stem, above the level of most of the feeding birds. [This contrasts with the Chestnut-breasted Mannikin, which has the rump and short uppertail-coverts neat and close beneath the wings, even when singing].

The vocabulary appears to be fairly limited, consisting of variations on a single note, plus the song. The contact call in flight is a long clear *psiiitt*, but within the group it is a sharp *psit*. The contact note of the male has a slightly different tone from that of the female.

The breeding season is recorded as being from October to April with the juveniles moulting into adult plumage from four to six months of age [Peckover and Filewood, 1976]. We saw juveniles in every stage of plumage from totally juvenile, through those beginning to show a few adult feathers, to birds that were mostly in their first adult plumage - a slightly duller version of the second moulted adult. However, there was evidence that breeding was taking place. Adult males were seen performing undirected song, sitting still, with neck slightly stretched, bill open and pointing forward, feathers of the flanks and belly fluffed out. An adult male was seen in full advertisement song when the head is turned from side to side through an arc of about 50 degrees. I did not see full courtship display, but this is described by Baptista (1991) and enables me to make a comparative sketch. Several males were seen

flying off in a direct and determined manner carrying lengths of grass, clutched at one end so that it trails along the body beneath a wing and behind, appearing to be attached to the tail. One male was seen tearing off a stem from the florescence of the feral millet *Panicum maximum* and then flying off in a direct line towards some bougainvilleas where, we assumed, a nest was being lined.

Two kinds of feeding behaviour were observed. Firstly, a bird would cling to the stem of a grass and peck out the seeds from the panicle to which it was clinging, or one within reach. I watched birds clinging to the thick stems of *Setaria* sp. rushes, and reaching out to feed on the green seeds of *Panicum maximum* alongside. We observed them feeding on brakes of ripe grey-brown *Rottboellia exaltata*, amidst swathes of rich green plants not yet producing seeding heads.

The second feeding behaviour was exhibited when the birds flew down to the ground and hopped around among short grasses, including what looked to me like *Chloris barbata*. Some birds hopped out on to the path and were observed picking up unidentifiable bits. Others jumped up to the seeding heads, maybe a foot or more, to grasp a panicle and fall back to the ground. A bird might jump 3 or 4 times before succeeding in pulling a stem down, whereupon it would stand on it and eat some of the seeds. I never saw a bird eat a seeding head out completely. This is consistent with all grass seed eating by *Lonchura* spp that I have observed, the bird will eat some of the seeds in a head then move on. Baptista recorded seeding heads being cleaned of seeds. This feeding behaviour was identical for both species. On one occasion I saw a few birds hopping about the ground beneath densely matted tall (1.5 m high) dried out grasses. I assumed they were searching for fallen seeds.

At night the birds I kept for painting all slept in a row, tightly clumped side by side, around the rim of the food pot. As they roosted up, their contact notes were the same consistent *psit* of the birds when they were active and in close sight of each other, although slightly muted.

At the lowland levels of savannah the Grey-headed Mannikins were always accompanied by a smaller number of Chestnut-breasted Mannikins. The one exception to this appeared to be the trapped 27, of which over half were adult Chestnut-breasted and most of the rest were juveniles of one or other of the two species. At the foothills, after we passed Sogeri and beyond, there were only small groups of Grey-headed without any Chestnut-breasted birds.

**CHESTNUT-BREASTED MANNIKIN -***Lonchura castaneothorax ramseyi*

This is the south-easterly of the four sub-species that occur in New Guinea. It is quite distinct from the others. *L.c. sphaerpei* is a diminutive 100 mm or so, and has the forehead to nape pale grey, and the underwing-coverts buffy-salmon. *L.c. uropygialis* is similar but is distinguished by having a little yellow on the uppertail-coverts. Both are exclusively from Irian Jaya. The race *boschmai* from the Wissel Lakes District (Goodwin, 1982) and the Araboe River area (Rand and Gilliard, 1967) I am unfamiliar with, not having seen it live. The skins from which I painted it in the British Museum collection indicate a distinctive bird with a chestnut breast and chestnut barring on the flanks, drab from forehead to nape and yellow uppertail-coverts. Its size is unknown to me. Any observations or comments about *boschmai* would be most gratefully received.



Robin L. Restall

*L. castaneothorax ramseyi/nigriceps*

Recently-fledged juveniles have blackish bills, and, notwithstanding the pale belly and undertail-coverts, can be mistaken for a young *Lonchura caniceps* in the field. This blackish bill soon turns to a violaceous pale blue-grey, probably within two to three weeks after fledging when the birds become independent and fully able to feed themselves. The implication in finding black-billed juvenile *Lonchura castaneothorax* is that the species must have been breeding in June, an extension of the breeding season brought on no doubt by the exceptional rainfall of that month [rainfall recorded in June 1989, a normal year, was 16 mm. In this June the measured rainfall in the area was 169 mm].

The south-eastern race, common around the Port Moresby area in the lowland savannah and marshy areas west to Hall Sound, was formerly known as *Lonchura castaneothorax nigiceps*. The adult male measured from 110 mm to 113 mm., the adult females I measured were all 105 mm long. The wings of the males measured 52 mm, females were insignificantly different at 51 mm or 52 mm. The underwing-coverts are white. I could not see any consistent plumage distinction between the sexes but there was a distinct tendency for the nape of the male to be less clearly ticked with grey, and conversely the female has the ticking regular and clear from crown to nape. Thus, with a quantity of birds to hand it is fairly easy to select certain males, certain females, and of course to have a quantity of uncertain. These comparisons were made on birds all in perfect new plumage. Despite Immelmann's comment that the species appears to have only one call note [as the Grey-headed in fact does] I found the voice of the Chestnut-breasted Mannikin to be more complex and the bird appears to have a rich and varied vocabulary. While the contact calls are similar to those of the Grey-headed Mannikin's a strong *peeet* on the wing, the close contact notes are several and varied. The contact note of the male is different from that of the female, and one of the birds, I think it was a male, had a *zeet-a-zeet-a-zeet-a-zeett* on a descending scale that sounded both intimate and comforting. It cannot be heard more than a metre or so away, and is quite distinct from the courtship song. I observed a male engaged in undirected song on two occasions. The bird sat on barbed wire, body clear of the perch, neck stretched and head pointing slightly down, maybe 10 degrees below horizontal, flanks and belly feathers erect. This is a typical *Lonchura* posture for undirected and advertisement displays.

At night, the birds I kept for study and painting all settled down in one melange in the food pot as if it were a nest. It was obvious



Robin L. Restall

Grey-headed Mannikin, drawn near Port Moresby  
undirected advertisement song

also believe the Yellow-rumped Mannikin *Lonchura flaviprymna* is conspecific with these two. There will always be a school of lumpers [other targets are the Streak-headed Mannikin *Lonchura tristissima* and the White-spotted *Lonchura leucosticta* as one, and the White-crowned *Lonchura nevermanni* and Black Mannikin *Lonchura stygia* as another]. The basis for this compulsion to simplify is the Geographic Species Concept which holds that if two species co-exist in a habitat and do not naturally interbreed then they are separate species. Thus the opposite must be equally true, in that if hybrids occur naturally then the two animals are conspecific.

I feel that if two animals, in this case birds, have evolved to the state where they are physically and behaviourally distinct then the focus of study should be on why and how and what factors have driven them apart, and I see no benefit whatsoever in lumping them into a singularity. New Guinea's mannikins are a wonderful living laboratory of evolution and should be the subject of a major study. Diamond (1979) has written eloquently about this in his discussion of the probable rapid evolution of *Lonchura spectabilis gajduseki*. The recent discovery of another very distinct sub-species with cinnamon underparts in the Urima Cattle Station in the Sepik

Plains, *Lonchura spectabilis sepikensis* (Jonkers and Roersma, 1990) dramatises his argument and makes it as contemporary as ever. In fact, in this world of rain forest destruction when all is woe, it is a small compensation that new habitat favouring the evolution of new races [and no doubt new species?] is being created.

In my judgement the Chestnut-breasted Mannikin and the Grey-headed Mannikin are good species. They are physically different, they have different behaviour patterns, and different voices. Admittedly the differences are not dramatic, but in my opinion they are enough. The Chestnut-breasted Mannikin is a notoriously promiscuous species. In addition to the two species already referred to it naturally hybridises with the Spice Bird *Lonchura punctulata* in the wild in Australia (Immelmann). Oddly however, the lumpers are not suggesting conspecificity here. It has become domesticated, and has produced new colour variants, as well as hybrids with several other species of *Lonchura*, and several other estrildid species. Furthermore, the juveniles are distinct. This may be a small point but similarity of juvenile plumage is always held up by lumpers as constructive evidence of conspecificity so differences should evidence the opposite.

In their work on the evolutionary genetics of the Estrildidae, Kakizawa and Watada (1985) used protein electrophoresis to calculate the genetic distances between a considerable number of species of estrildid finches. Two of these were *Lonchura flaviprymna* and *Lonchura castaneothorax*. Whilst they are undeniably closely related species, they are demonstrated in the study as being distinct species.

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## CAPTIVE BREEDING AND MANAGEMENT OF WHITE-NAPED CRANES AT JERSEY WILDLIFE PRESERVATION TRUST

By Hilary J. French (Bird Section) and Hywel Glyn Young  
(Section Head, Birds).

The White-naped Crane *Grus vipio* is listed as vulnerable (King 1981, Collar and Andrew, 1988) and its future survival is threatened by a variety of factors, including habitat destruction and with it the encroachment of human land use. Counts at wintering grounds in 1989/90 in China and Japan estimated the wild population at about 4155 birds (Anon. 1990). The maintenance of a viable self-sustaining population in captivity is desirable to ensure the long term survival of this bird. This article will focus on the management and captive breeding of White-naped Cranes at Jersey Wildlife Preservation Trust between 1984 and 1990.

The International Studbook for the White-naped Crane (Sheppard, 1989) held by the New York Zoological Society summarises the status of the species in captivity, and in 1989 297 individuals were listed as being held in various institutions worldwide. The White-naped Crane masterplan (Anon. 1988), although dealing specifically with the North American population, provides useful guidelines for the management of the species in captivity, taking into account factors such as genetic diversity, age, sex, fecundity and longevity. A European equivalent is provided by an Europaisches Erhaltungszucht Program or European Endangered Species Breeding Programme (E.E.P.) (Neugebauer et al., 1989) which formulates breeding plans for selected endangered species held in European collections.

The Trust has held a pair of White-naped Cranes on loan from Whipsnade Wild Animal Park since 1984. The male was bred at Whipsnade in 1983, and the female was presented to the same collection by the Hong Kong Government, having been captured from the wild. Most of the data were collected over a period of five seasons, in three of which parent-reared chicks were produced without the complications sometimes encountered in crane rearing e.g. disproportionate weight gain and associated bowed leg syndrome (Guittin, 1986) and imprinting in hand-reared chicks (I.C.F. pers. comm.).

The cranes have an enclosure covering an area of approximately 600 square metres. The perimeter is bounded by chain link fencing

which reaches a maximum height of 1.82 m where it forms the divide with another enclosure containing a variety of waterfowl and a group of Grey-necked Crowned Cranes *Balearica regulorum*. No problems have been encountered in keeping these two genera in adjacent areas, even though despite being pinioned both male and female and their offspring do occasionally leap the fence. With the male this often coincides with slightly breezier weather conditions and, with any offspring, occurs most frequently when the family group begins to disintegrate. The cranes have visual contact with visiting members of the public on all four sides of the enclosure, three of which are bounded by public footpaths. This does not appear to distract the birds during the breeding season.

The enclosure is situated on gently sloping ground covered by grass. A small stream runs through the enclosure allowing a constant supply of non-stagnant water. This is used by the cranes for drinking, bathing, and foraging as well as providing a nesting and roosting site. Vegetation is both natural and exotic. A dense mat of brook lime *Veronica beccbunga* (a water weed) provides areas for probing and material used in nestbuilding in the spring and summer. A giant prickly rhubarb *Gunnera manicata* also provides a favoured foraging area. There is ample shade provided by willow *Salix sp.*, swamp cypress *Taxodium disichum*, and a Dove tree *Davidia involucrata* and an Italian alder *Alnus sp.*

The dietary maintenance of all cranes in captivity is relatively simple. At the Trust in the winter the adults are fed on a poultry layers ration, wheat and flamingo maintenance diet. These are provided in a length of plastic drain pipe measuring approximately 40.5 cm with a diameter of 16 cm. This is sunk into the ground to hold the pipe in place. The summer diet consists of the two first ingredients with flamingo breeder pellets. During the breeding season this is scattered on the ground to avoid disturbance by entering the enclosure, and also making it easier for the crane chicks to feed. Both adults and chicks forage for insects, worms and vegetable matter. Occasionally the young of wild birds are found.

Pairing of the cranes took place in 1984 with their first potential breeding season in 1985, when the female was at least four and the male two years old. It is difficult to ascertain when White-naped Cranes attain sexual maturity both in the wild and in captivity. In the wild they can be compared with other *Grus* species, e.g. Sarus Crane, *Grus antigone* and the Australian Crane, *Grus rubicundus*. The former has bred at seven years old (Johnsgard, 1983). In

captivity it appears that they can attain maturity at three years old (Johnsgard, 1983 reference to hand-reared birds). Juveniles kept in mixed flocks will also begin pairing up at this age (Anon 1988). Initially the absence of any substantial breeding behaviour in the pair at the Trust can probably be attributed to the male's immaturity and to insufficient time for establishing pair bonding essential for successful breeding.

During their second breeding season in 1986 three infertile eggs were laid. The first egg was not laid in the nest, and excitable behaviour from the male, stabbing at the egg and tossing it into the air, plus the risk of predation by gulls, *Larus argentatus*, necessitated the removal of the egg for artificial incubation. Since it was not replaced by a dummy egg the female laid a further two eggs to make a normal clutch size of two, it being exceptional for cranes of the genus *Grus* to lay a three egg clutch (Johnsgard, 1983). For these reasons both eggs were also removed for artificial incubation. The cranes' comparative lack of interest in their nesting duties, with little or no defence of the nest and eggs, could possibly be explained by inexperience.

Erratic early breeding behaviour of a relatively recent pairing of young birds could explain the absence of any substantial nesting activities in 1987. The initial age of nesting of one particular pair of White-naped Cranes in captivity was at twelve years old (Johnsgard, 1983). In 1987 there was only one observed mating and no eggs were laid. However, further explanation can be offered with a comparison of nestbuilding activities from 1986 - 90 inclusive as shown in Table I. In 1987 the first signs of nestbuilding were not recorded until 16th May which is a little later than their first breeding season in 1986 when nestbuilding commenced on 12th May. There is very little comparison between these dates and those of the three following and successful seasons with one or two clutches being laid and chicks reared. The earliest nestbuilding of the last three seasons was on 10th March 1989, their fifth season, when two clutches of eggs were laid. In 1990 there was a similarly early date of 12th March, but only one clutch of eggs laid. In 1988 nestbuilding from 7th April was followed by two clutches of eggs. Whilst one cannot draw too many conclusions from this, it nevertheless provides an interesting comparison between the initial years of pairing with unsuccessful breeding, and thereafter a more experienced pair starting their breeding season early enough to lay two clutches of eggs should the need arise, and rearing their own chicks.

It was in their fourth breeding season that greater maturity and a closer pair bonding was exhibited by more frequent displaying and vocalizing. After an unsuccessful first clutch which was removed for artificial incubation (one egg was infertile, and the other dead in shell), two fertile eggs were laid. The nest site was defended vigorously and two chicks were successfully reared to fledging by their parents. There have followed two successive breeding seasons with parent-reared chicks.

The breeding season usually starts in late March with the onset of nest building. Both sexes participate and a large, somewhat untidy nest is constructed. Both birds continue to add fresh material, particularly aquatic vegetation, throughout the breeding season. Rearrangement of nesting material is also frequent by both male and female whilst performing incubation duties.

A variety of material is used in constructing the nest including vegetation found naturally within the enclosure such as the aquatic *Veronica beccbunga*, *Juncus* sp. rushes and sticks. Additional material such as straw and clippings from plants such as dogwood *Cornus alba* is provided, and the cranes readily incorporate these into their construction.

The cranes have a favoured nest site which it has become traditional for them to use, situated in the middle of the stream. However, changes in nest site have occurred in the past with the abandoning of one nest site in favour of a new one to lay a second clutch of eggs.

A nest area plays a very important function in the rearing of the chicks, which extends beyond the period of incubation and the immediate post-hatching phase. It is used consistently to brood the chicks, both during the day in inclement weather and at nightfall. The chicks will still use the nest as a safe place to return to during the hours of darkness when as old as thirty seven days, although by this stage whilst the chicks sleep on the nest, the parents roost nearby.

Occasionally a makeshift nest consisting of an area of flattened vegetation is used during the daytime, noticeably in spells of hot weather. The female will also brood the chicks on this temporary nest site. The use of an alternative nest or nesting place for the chicks was seen during the 1988 breeding season, although it was not used until the chicks were approximately fifteen days old, and spending an increased amount of time exercising and foraging over a wider area.

Once nestbuilding is completed a clutch of usually two eggs is

laid. The earliest dates for laying a first clutch were between 27th and 30th March (1990, fifth actual breeding season) with the latest not until 19th - 25th May (1986, first actual breeding season) (see Table I). When first clutches were removed a second clutch was laid as a replacement. Incubation starts with the first egg as in all crane species, and duties for the 28 - 32 day period are shared by male and female (Johnsgard, 1983). Although observations of incubation duties were recorded these were insufficient to ascertain what proportion was carried out by the male and female respectively, or the duration of each sitting.

The behaviour of the cranes was interesting during the incubation period, and changed noticeably after their second breeding season when there had been little or no defence of the nest and eggs, and no unison calling or displaying at the nest was observed. Their fourth breeding season marked a turning point with both birds being far more defensive of their eggs when they were removed for artificial incubation. This behaviour continued with the second clutch which was left with the pair who successfully demonstrated their ability to defend the nest area and incubate consistently. Displaying and unison calling both took place at the nest site and the male threatened aggressively when staff entered the enclosure. Similarly gulls *Larus argentatus* and rabbits *Oryctolagus cuniculus* were chased off vigorously, particularly by the male. Evidence of a better developed pair bond was also seen with the non-incubating bird often standing in attendance at the nest whilst the other bird incubated.

With asynchronous hatching the result of incubation beginning with the first egg, inter-sibling rivalry is a common occurrence both with parent reared and hand-reared chicks (ICF pers comm). In both 1988 and 1989 two chicks were hatched. Both pairs of chicks were seen fighting; in 1989 as young as one and two days old. In these cases although the older chick would always be slightly more precocious, inter-sibling rivalry never reached the point where there was the real possibility of injury.

From the day of hatching parental care included bringing invertebrate food to the chicks at the nest, although they nearly always walked a short distance from the nest area a few hours after hatching. Attempts are made to peck at objects on the ground even though this is not very productive until the chicks are at least several days old.

Supplementary feeds were given to the cranes several times daily shortly after chicks hatched. These consisted of chopped raw

TABLE 1

Egg laying and rearing 1985 - 90 inclusive

Clutches 1985-90 Inclusive	Eggs per clutch	Date of Laying	Infertile	Dead Embryo	Dead in Shell	Hatched	No reared to fledging
1985							
1986	3	19.5.86 22.5.86 25.5.86	3				
1987							
1988							
1st clutch	2	10.5.88 12.5.88	1		1		
2nd clutch	2	26.5.88 29.5.88				27.6.88 29.9.88	2
1989							
1st clutch	2	7.4.89 10.4.89		1		7.5.89	1 handreared
2nd clutch	2	23.4.89 26.4.89				25.5.89 27.5.89	1
1990	2	27.3.90 30.3.90	1			29.4.90	1
TOTALS	13		5	1	1	6	5

heart or pink mice, mealworms, grated hard boiled egg, poultry chick crumbs, finely chopped apple, and grated cuttlefish and vionate powder as a vitamin supplement. Once the chicks began foraging successfully for themselves they were also able to feed on adult rations of poultry layers pellets and flamingo breeder pellets. However care was taken in the dietary constituents and quantities available to developing crane chicks, since diet can be a contributory factor in causing bow leg syndrome (Guittin, 1986).

At the International Crane Foundation weights of parent-reared and especially hand-reared chicks are monitored closely, and should daily weight gains for the latter become excessive then food rations are limited and a programme of increased exercise is initiated (ICF pers. comm.). The Trust has never experienced leg problems with any of the crane chicks reared, including a single chick which was hand-reared on a diet of chick crumbs (later replaced by poultry layers pellets), chopped hard boiled egg, lettuce, Sluis, (insectivorous food), crickets and mealworms which were fed on a rationed basis.

In the years where siblings have been raised it was noticeable that for a short period of time, usually in the days immediately following hatching, each parent would assume more responsibility for one chick than the other. This displayed itself in the form of feeding duties, with supplementary food and invertebrate matter collected and delivered consistently to a particular chick whilst ignoring the other.

Exercise was very important in the development of normal legs and toes, and with their parents the chicks all walked short distances from the day of hatching. A large area to forage in, and parents who led the chicks to food sources as opposed to always bringing the food to them, encouraged exercise throughout the rearing period.

Since the cranes are kept in an uncovered area all chicks are pinioned. This does not appear to affect the copulatory performance of the male, shown by the fertility of eggs at the Trust. Pinioning is done soon after hatching, usually when the chicks are three to four days old. The chicks are briefly removed from the enclosure, pinioned, weighed and wormed without appearing to upset the family group unduly. Once the chicks are replaced group activity quickly resumes.

A programme of chick worming is undertaken to avoid the occurrence of gapeworm, *Synagamus* sp., one chick having died from this in 1989, despite a single dosage of Panacur (Fenbendazole).

The disease manifests itself with breathing difficulties, gaping and head shaking, caused by worms in the bronchial tubes and trachea. It is treated using Panacur at the rate of 200 mg per 5 kg body weight which is given orally initially when chicks are pinioned. Subsequent treatment occurs periodically throughout the rearing period, occasionally given orally as a single treatment, or usually as a three-day course with the required dosage injected into pink mice. When fed these are faithfully delivered by the male crane to the chick. The stress of capturing chicks each time is thereby avoided. This is effective both as a preventative and a curative measure, two chicks having been successfully treated for the symptoms of gapeworm by the administration of Panacur in this manner.

As long lived slow maturing birds, cranes have a long association with their parents. Archibald and Veiss (1979) have recorded the fledging period of White-naped Cranes in captivity as at least seventy days. Chicks born to the pair at the Trust are tolerated by their parents until February or March of the following year (a period of approximately 8 - 10 months). The family bond begins to disintegrate in the preceding months with juveniles spending more time foraging independently. There is also increased restlessness and intolerance by the adults to the presence of the juveniles. In particular the male will attempt to strike at juveniles who then adopt a very submissive hunched posture, appearing far more comfortable with the female who seems more tolerant. The onset of a new breeding season increases the male's intolerance as he starts dancing with the female. On several occasions when young cranes have leapt the fence this could probably be attributed to a flight reaction to threatening behaviour from the male. On each occasion that they have been removed from the enclosure neither the male nor the female has shown any distress or attempted to retain vocal contact.

In the wild once immature White-naped Cranes have left their family group it seems likely that flocks of non-breeding birds are formed (at least on the wintering ground), but which still attach themselves to the main concentration of cranes (Johnsgard, 1983). At the Trust young cranes are managed collectively until breeding age. Four young cranes at the Trust now are being managed in this way.

As a safety measure, should the wild population be unable to sustain itself, successful captive management and breeding of White-naped Cranes is desirable. Whilst being selective in the pairs that are allowed to breed (taking note of variables such as

genetic diversity, age, fecundity etc. as considered in the White-naped Crane Masterplan, 1988), parent-reared crane chicks provide a very satisfactory means towards achieving this end. Furthermore given compatible birds that have good pair bonding and are held in a suitable enclosure, hand-rearing and some of its associated problems need not be encountered.

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Products mentioned in the text:

FLAMINGO PELLETS: Breeder and maintenance pellets manufactured by Mazuri Zoo Foods, Special Diet Services, Stepfield, Witham, Essex CM8 3AB, Great Britain.

GOLD STARTER POULTRY CHICK CRUMBS: Manufactured by Dalgety Agriculture Limited, 180 Aztec West, Almondsbury, Bristol, BS12 4TH, Great Britain.

PANACUR: Worming treatment manufactured by Hoechst Animal Health, Division of Hoechst U.K. Limited, Walton Manor, Walton, Milton Keynes, Bucks MK7 7AJ, Great Britain.

SLUIS UNIVERSAL FOOD: Insectivorous food manufactured by E.W. Coombs Limited, Frindsbury Road., Strood, Kent, Great Britain, under licence from Sluis B.V., Etten - Leur, Holland.

VIONATE POWDER: Vitamin/mineral feed supplement manufactured by Ciba-Geigy Agrochemicals, Whittlesford, Cambridge, CB2 4QT, Great Britain.

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## FECUND AFRICAN CROWNED CRANES

By J. B. Blossom (Ingham, Norfolk)

A pair of East African or Grey-necked Crowned Cranes *Balearica regulorum gibbericeps* was acquired from a private water fowl collection on the death of its owner in December 1975. The pair had been seen in July 1973 in the previous owner's establishment. They were in adult plumage, and had the run of some scores of acres with a herd of Fallow Deer *Dama dama*. More details of their first breeding whilst in the possession of the author are given elsewhere (Blossom, 1984). Suffice to say here that in 1983, the year the pair first bred, they were at least 12 years old. It is assumed that they were wild taken. From a survey conducted in 1980 (Blossom, 1981) the author recorded that only one pair of the Grey-necked sub-species *B. r. gibbericeps* had reared young in captivity in Europe (Steele, 1977) previously. However in 1980 Grey-necked Crowned Cranes were bred at Bird Paradise, Hayle, Cornwall (from Newton Steele's breeding pair), and at Flamingo Gardens, Olney, Buckinghamshire, and fertile eggs were laid by a pair at the Jersey Wildlife Preservation Trust.

In 1983, the year in which the author's pair first bred, the Zoological Society of London, Regents Park had a pair which laid and reared four young. This pair appears to have been almost as fertile and prolific in subsequent years. Since then other collections, including Lilford and Stagsden, Bedfordshire, have been notably successful. Sadly, few, if any, of these original pairs remain extant. Trauma and accidents have taken their toll. The question that begs itself is where have the young produced gone? And have any bred in turn to produce young from captive bred parents?

The author's pair started laying in 1981 after being in his possession for six years. To date, December 1991, they have laid a minimum of 71 eggs, plus at least two which were taken by predators. Though copulation has been observed on only three occasions, all between 5 and 5.30 am, all of the eggs have been fertile. It may be of interest to add that both birds are pinioned. The breeding performance of the pair is summarised in Table 1.

1st egg, 1st clutch laid	Numbers			
	clutches	eggs	hatched	reared
13th July 1983	3	10	7	7
1st July 1984	3	12	12	7
7th July 1985	2	8	4	3
7th July 1986	3	10	8	3
6th July 1987	3	9	?	4
17th July 1988	2	7	6	3
7th July 1989	3	10	7	3
? 1990	2	6	3	1
13th July 1991	2	7	5	2
Total in 9 seasons	23	71	52*	33

\*at least 56 including eggs of those reared in 1987

TABLE 1.

Incubation has been practised in different ways, including a combination of parent, broody hen, and incubator. Attempts at allowing parents to incubate and rear their young themselves failed in 1985 and 1989. Prolonged wet spells soon after hatching, and lack of enough live food, which the parents seek by foot stomping on grass tussocks, taking for example Crane Flies *Tilpula oleracea* lead to chick loss very quickly. The parents do not pick up inanimate food such as proprietary poultry rearing chick crumbs to give to the young, although these have proved satisfactory for hand rearing.

Losses of young after hatching successfully and being artificially reared occurred for several reasons. The most frequent cause has been trauma caused by older dominant siblings from the same clutch. It must be remembered that they hatch asynchronously. Chilling, by being pushed away from heat lamps by a more dominant chick is another cause as also is getting damp in long wet grass after exercising.

Two chicks hatched in different years turned out to be "star gazers", (a term used for the same or a similar condition in domestic poultry). The chick is unable to lift the head into the normal position, but walks with the neck down and head inverted. These

both had to be euthanased. The cause of the condition has not been established. One chick, apparently healthy at 5 weeks old, died within 48 hours of appearing unwell. Post mortem examination revealed in the gizzard a spent air gun pellet (lead) which it must have found for itself. Trauma to two older chicks was also caused by their falling from a raised brooder to the ground (the brooder sides were not kept high enough as the chicks grew). Crane chicks land heavily, with no "spring" in their legs to withstand shock, unlike, for example, pheasant or poultry chicks. Two others died as hatchlings probably through unintended starvation whilst they were being looked after, in the author's absence, by a volunteer who did not appreciate that hatchling crane chicks need to be hand/bill fed for at least their first 5 days. Another, at four weeks, was killed overnight in an outside brooder by a Weasel *Mustela nivalis* which was trapped subsequently after it had been responsible for the demise of several half grown waterfowl.



*Joe Blossom*

Hatchling drying out in incubator

After nine years, during which 33 independent fledged young were produced, it would be gratifying to record productive second generation pairings. Sixteen specimens have gone to private collections and seventeen to zoos or bird gardens open to the public. The author has been able to keep track of only a few. The loss of five by trauma, and one by accidental poisoning with a rodenticide is known, and a female was killed by a wild taken male with whom attempts were being made to pair up.

Two females are known to have laid eggs. One female, paired to a sibling male, both hatched in 1983, laid 3 eggs in 1988 i.e. at 5 years old. These proved infertile, but were of a good shape and size. The second female, referred to previously as having been killed by a wild taken male, was also hatched in 1983. She laid 3 eggs in 1990 i.e. when 7 years old. These eggs were returned to the author for incubation but were clear. The first female is with a new owner and is re-paired to a wild taken male.

The removal of the adult birds to the author's new home across the country, with a change of enclosure and environment, which may not be conducive to continued reproductive activity, prompts the writing of this paper. Now (January 1992) they are at least 20 years old.

#### Postscript:

Mr. and Mrs. Philip Wriglesworth, Yorkshire, bought a pair of Grey-necked Crowned Cranes at the closing down sale at Lilford Hall in 1989. They believe that this pair was bred at Lilford. They bred for them in 1991, producing one chick. It appears likely, but is still to be verified, that the young bird will be the first recorded second generation captive bred Grey-necked Crowned Crane, certainly in the U.K.

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## BREEDING AND BEHAVIOUR OF THE BLACK-TAILED HAWFINCH

By Jeffrey Trollope (Middlesex)

The large, attractive and interesting Black-tailed Hawfinch *Coccothraustes migratorius* has been imported into the U. K. and Europe for many years, although the shipments have been few and irregular and usually contained a majority of male birds. With the current ever-increasing restrictions on bird importations into the U. K. the future availability of this species and other imported birds is very uncertain. There have been several unsuccessful breeding attempts recorded in the U. K. Whittaker Carr (1964) reported that eggs were incubated but not hatched and Beckett (1964) had chicks hatched but not reared. In 1975 I had a pair which hatched chicks but the female was found dead on the nest when the chicks were three days old. In recent years, I have heard of three other unsuccessful breeding attempts. The major problem during the unsuccessful 1975 breeding appeared to be the cock's driving the hen to nest again before the chicks of the first brood were reared. In this paper, I record the breeding of *C. migratorius* in 1991.

The species, which is about 19 cm (7 inches) long and has a massive stout yellow bill bluish grey at the base and ashy grey at the tip, is sexually dimorphic. The cock's upper parts are greyish brown and its underparts are greyish white with a rufous wash on the flanks and the sides of the breast. Its entire head, white-tipped wings and tail are black. The upper tail coverts are white, the irides are very dark brown with an outer zone of light reddish brown and the legs and feet are flesh coloured. The hen lacks the black on the head, has the upper parts greyish brown and is lighter below with the flanks and sides paler than those of the cock. It occurs in Eastern Asia and is distributed from China to the Amur. It inhabits forests, scrub, bamboo, agricultural areas and gardens.

A pair of *C. migratorius* was purchased in January 1990 and was housed for a period of establishment in an outside birdroom, heated to a minimum temperature of 8 - 10° C (45 - 50° F). A twelve hour day was imitated by electric lighting. In April 1990 the pair was released into an aviary (No 2) 3 x 1 x 2.5 metres high (10 x 3 x 8 ft. high), approximately one third of which is covered with weath-

erboards and roofing felt. In this area cut conifer branches are hung to provide seclusion and nesting sites, with cup-shaped wire and wicker nesting receptacles fixed at various heights. The male bird was found dead in May. It appeared that it had flown into the aviary wire, probably because of harassment by a cat. In August I obtained another male from a bird keeper. The female of his pair had died after she had hatched chicks. Following a period of isolation, I released this male into the aviary with the female. There was some courtship feeding, but no other indication of breeding activity was observed during 1990. The basic diet given is mixed millets, canary mixture, sunflower, greenfood, coarse grade softbill food, soaked seed and mealworms.

### *Breeding*

The pair were removed from the aviary (No 2) during February 1991 while it was being refurbished with fresh cut conifer branches and its perches and nesting receptacles were being cleaned and replaced. The nesting material provided consisted of dried grass and convolvulus stems, feathers, moss, twigs, dead leaves and coconut fibres. On 5th March the pair was returned to this aviary. The male began to sing and both birds were seen carrying grass stems on 10th March. The male courtship fed the female during April and a well made nest was built in a wire cup-shaped basket. The materials used were convolvulus, grass stems and twigs and the nest was lined with coconut fibres and a few feathers. The nest was about 1.8 m (6 ft.) from the aviary floor.

Copulation was observed taking place on the ground on 5th May and the first of three eggs was laid on 7th May. Incubation appeared to commence on 10th May, the eggs hatched on 23rd and three chicks were found dead on the ground during the morning of the 28th May. The same nest was used again for the second clutch and the first of three eggs was laid on 1st June. It was difficult to ascertain the date incubation commenced but it was probably on 3rd June. Three chicks hatched on 16th June, two were found dead on 18th and one chick left the nest on 28th June. The chick had only rudimentary tail feathers and the primary wing feathers were not developed. The chick hopped from branch to branch, moving across the aviary and soliciting food from both parents. On 3rd July the chick was flying well and on 4th the female laid the first egg of the third clutch of three eggs in the same nest. The fledged chick of the second brood was flying well by 7th July and was being fed by the male. By 19th, the chick was independent of its parents and was removed from the aviary on 26th July. The chicks of the third

brood had hatched and were found dead on the ground when they were approximately seven days old. Two further broods were hatched and the results for the five broods are summarised in the following Table.

Clutch Number	Number Of Eggs	Date First Egg Laid	Number Hatched	Number Fledged	Number Reared
1	3	07.05.91	3	-	-
2	3	01.06.91	3	1	1
3	3	04.07.91	3	-	-
4	4	08.08.91	4	1	-
5	3	02.09.91	3	-	-

*Breeding Synopsis - 1991 C. migratorius*

The same nest was used for all the broods. Apparently extra material was not added, apart from a lining of coconut fibres. On several occasions the male was seen carrying material to the nest. The ground colour of the eggs is pale-blue spotted and blotched with dark and ashy brown, usually with a few blackish scribblings at the larger end. They are sub-elliptical and slightly glossy. Two eggs from those laid in 1975 measured 22.2 x 15.8 mm and 22.8 x 16.2 mm; the clutch size was 3 - 4.

Incubation was carried out by the female but on a few occasions the male was seen to cover the eggs for a brief period, whilst the female was feeding. The female sits very closely and will not leave the nest unless you are in touching distance; the incubation period is 13 - 14 days. The young chicks, before feathering, have a grey skin with sparse grey down. The gape is pinkish-red and the gape flanges are dull white. The chick from the second brood which was reared to independence resembled the female after it fledged, except for its head, which was light brown, indicating it was a male. The primary feathers were black with irregular and small areas of white. At the time of writing (December 1991), this bird appears to be in full adult male plumage.

From March 1991, the birds basic diet was supplemented with live house crickets and waxmoth larvae. From the end of April, live invertebrates were collected from nettle beds and bushes, although the yield was variable and very poor in wet weather. The adults fed the chicks on mealworms, soaked and hard seed, a little softfood and the collected invertebrates. The parents were not seen to feed the chicks on waxmoth larvae or house crickets.



*J. Trollope*

*Black-tailed Hawfinch 21 days old.*

### *Behaviour*

In 1975 and 1991 the onset of breeding was preceded by the male's courtship feeding of the female and singing. The male bird would approach the hen to feed her. When about 15 cm (6 in) apart they would stretch out their necks and touch bills. The female often jabbed at the male with her bill when he would retreat, before

repeating the same behaviour until the female took the food offered. Copulation, which usually took place on the ground was preceded by courtship feeding. During incubation the male sometimes flew to the nest with material, such as a feather or small twig, which the female usually took from him.

In contrast with the unsuccessful breeding attempts of 1975, there was little evidence of male aggression to the female during 1991. It appears that lack of suitable livefood was the reason for the rearing of only one young bird to independence, from a 100% hatch from five clutches. "Naturally" collected livefood is probably the optimum diet, but the yield from natural sources is unreliable. It is hoped that experiment with a greater variety of commercially bred livefood, combined with the collection of natural livefood, may bring better results.

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#### ADDENDUM

The Foreign Bird Federation's Register of Birds Bred in the U.K. lists five *C. migratorius* bred in 1990.

\* \* \*

This species is given the common name Yellow-billed Grosbeak in Clements Checklist, Birds of the World 1981.

\* \* \*

## CHESTER ZOO - BIRD NOTES 1991

By Roger Wilkinson (Curator of Birds)

Our male Masai Ostrich *Struthio camelus masaicus* received a new partner when a female of the same race arrived in April on loan from Cotswold Wildlife Park. A request from Haigh Hall Country Park for young Emus *Dromaius novaehollandiae* allowed us to permit our pair to rear two chicks but again we shall breed from these birds only if youngsters are specifically requested. The Rheas *Rhea americana* laid but failed to hatch any chicks in 1991 - the first year they have missed since 1983. Similarly Chilean Tinamous *Nothoprocta perdicaria* hit an all time low with only one chick produced.

This was more than compensated for by the Humboldt's Penguins *Spheniscus humboldti* hatching six chicks in Spring and a further two in early December. The White Storks *Ciconia ciconia* hatched five chicks of which the smallest was removed for hand-rearing. The parents successfully reared three of the four chicks left with them giving a total of four bred - compared to two in each of the last two years. Waldrapp Ibis *Geronticus eremita* hatched seven chicks but only two fledged of which one died shortly after leaving the nest. No hand-rearing was attempted although the parents were assisted in rearing by the supplementary feeding of chicks in the nest. Our aim is for the birds to learn to rear their own chicks unaided in order that the captive bred stock may be suitable for reintroduction programmes if required.

Our Caribbean Flamingos *Phoenicopterus ruber ruber* looked good in the early Spring but a spell of cold weather perhaps coupled with disturbance from nest prospecting Canada Geese *Branta canadensis* may have been responsible for no eggs being laid. The Chilean Flamingos *Phoenicopterus chilensis* surprised us in their first year in the new enclosure by nesting very close to the public viewing point and rearing three chicks. One late hatched chick found apparently lifeless at the side of the nest mound was resuscitated but died at less than a week old despite our efforts to hand-rear it on a commercially produced flamingo crop-milk substitute. A very late Chilean Flamingo egg was taken from the nest and hatched in the incubator. This bird received a diet based on that used for Caribbean Flamingos at San Antonio Zoo (Kunemann & Perry, 1990) and developed well but sadly died at 27 days old. To

our knowledge to date no Chilean Flamingo has been successfully hand-reared from the egg, although staff at the Wildfowl and Wetland Trust, Martin Mere, hand-reared a chick that had been first fed by its parents over a period.

Black-necked Swans *Cygnus melanocoryphus* reared two out of three of the cygnets hatched and amongst other waterfowl we were successful in rearing Hawaiian Geese *Branta sandvicensis*, Ruddy-headed Geese *Chloephaga rubidiceps* and Emperor Geese *Anser canagicus* and seven species of duck including four White-winged Wood Ducks *Cairina scutulata*. The latter youngsters again were reared as part of the Wildfowl and Wetland Trust's projects for this endangered Asiatic duck. New arrivals to the collection included a pair of Cereopsis Geese *Cereopsis novaehollandiae* from Jersey Zoo.



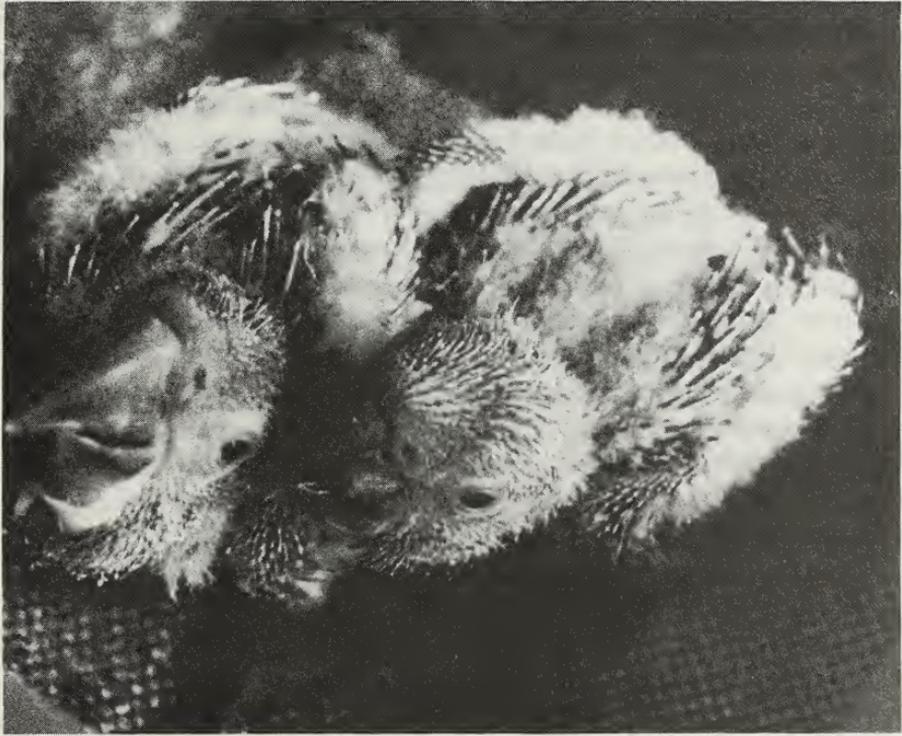
R. Wilkinson

White-winged Wood Ducks at Chester Zoo

The 1990 bred Andean Condor *Vultur gryphus*, named Henry VIII as he was the eighth chick reared at Chester, was sent on loan to Antwerp Zoo. In exchange for our sending Chester-bred Condors to Moscow Zoo the previous year we received two female Red-crowned Cranes *Grus japonensis* bred at Walsrode in Germany from Moscow-owned parents. More importantly our newly established pair of Red-crowned Cranes laid for the first time in 1991 with one chick being successfully bantam-reared and a second reared by the parents. A first egg was noted on the 18th May when the male was seen playing with the broken egg. We were concerned

that he might prove to be an egg eater and so when the second egg was laid on 30th May it was taken for artificial incubation. No nest had been built for this egg or for the third which was laid on 12th June. Again this egg was taken for artificial incubation. It was then agreed after some discussion that we should mow the paddock; some concern being expressed that this might disturb the pair of cranes. In fact this appeared to be just what the birds were waiting for. The female fashioned a nest from the fresh mown grass cuttings and laid her fourth egg on 18th June which she immediately began to incubate. The pair proved model parents and the chick hatched on 20th July. The second egg had previously hatched under a bantam on 2nd July although the third egg proved infertile. Both chicks were successfully reared and were introduced to each other in early January 1992. The Sarus Cranes *Grus antigone* were also particularly successful with two chicks being reared by bantams and a third by the parents. All three chicks and the breeding pair were rather reluctantly moved to other Zoos in order to free their enclosure to hold the two new female Red-crowned Cranes. We hope shortly to exchange one of the new females for a male so as to establish a second breeding pair of these endangered cranes. Two West-African Crowned Cranes *Balearica pavonina pavonina* were reared from three chicks hatched under bantams but the chick hatched by its parents in the paddock was sadly lost to a predator - we believe it may have been killed by a stoat *Mustela erminea*.

Blacksmith's Plovers *Vanellus armatus* and Crowned Plovers *Vanellus coronatus* were reared both by hand-rearing and under their parents. We were especially successful with pheasants in 1991. Edward's Pheasants *Lophura edwardsii* are now considered extinct in the wild and we were pleased to rear eight youngsters last year. We intend to hold at least two and if possible three pairs of these pheasants in 1992. Secondly our Temminck's Tragopans *Tragopan Temmickii*, received only the previous year, were especially prolific with nine chicks reared of which the last two were parent-reared. Satyr Tragopans *Tragopan satyra*, Himalayan Monals *Lophophorus impeyanus*, White Eared Pheasants *Crossoptilon crossoptilon*, Palawan Peacock Pheasants *Polyplectron emphanum* and Golden Pheasants *Chrysolophus pictus* were also bred. Having again only infertile eggs from our Congo Peafowl *Afropavo congensis*, our male was exchanged for a different male with London Zoo. Four Bare-faced Curassows *Crax fasciolata* and four Variable Chachalacas *Ortalis motmot* were reared, again the latter were reared by their parents.



R. Wilkinson

Red-fronted Macaw chicks hand-reared at Chester Zoo

Turning our attention to the parrots, our most significant breeding in 1991 was of five Red-fronted Macaws *Ara rubrogenys*. The first clutch laid by the Red-fronted Macaws at the end of May was of five eggs; of these two were fertile but both died during late incubation. A second clutch was laid in mid-July of which the first and fourth eggs were found on the aviary floor, but the other three were laid in the nest box. The two eggs laid on the floor were artificially incubated and both hatched and were hand-reared, the parents hatching the remaining three eggs and rearing all three youngsters. A first time breeding at Chester was that of the fabulous Hawk-headed Parrot *Deroptyus accipitrinus*. After several failed breeding attempts we decided to take the eggs for artificial incubation and three chicks were hatched and hand-reared. Other important breedings were of a Musk Lorikeet *Glossopsitta concinna* hatched in an incubator and the tiny chick hand-reared. This was particularly important to us as the egg was removed from the nest box after the death of both parents. This had left us with four females reared in previous years but no males. The

chick has now been sexed as a male and an unrelated female obtained as a future partner for this bird. The Greater Vasa Parrots *Coracopsis vasa* repeated last years first breeding success but this time doubling it by rearing four rather than two chicks. On the other hand only one Lesser Vasa Parrot *Coracopsis nigra* was reared. Other parrots bred included three Blue and Yellow Macaws *Ara ararauna*, two Derbyan Parrakeets *Psittacula derbiana*, six Lesser Patagonian Conures *Cyanoliseus patagonus*, two Yellow-backed Chattering Lorys *Lorius garrulus flavopalliatus* and three Musschenbroek's Lorikeets *Neopsittacus musschenbroekii*. Blue-throated Conures *Pyrrhura cruentata* were hatched but not reared. Fertile eggs were laid by the Lilacine Amazons *Amazona autumnalis lilacina* and by one of our two pairs of Green-cheeked Amazons *Amazona viridigenalis*. These were left under their parents but no chicks were hatched. New arrivals include a group of Cuban Amazons *Amazona leucocephala* recently presented by Customs and Excise. These will form the nucleus of a co-operative breeding programme for this species with the Zoo Federation Parrot Group. We also received a pair of Blue-streaked Lorys *Eos reticulata* on loan from Pencynor Wildlife Park and a Greater Patagonian Conure *Cyanoliseus patagonus byroni* coming from Antwerp Zoo. The latter has now been paired with a bird of the same subspecies at the Tropical Bird Gardens, Rode.

We hold four species of Turaco and three of these were successfully reared in 1991. Two Schalow's Turacos *Tauraco schalowi* and two Violet Plantain Eaters *Musophaga violacea* were hand-reared. The Red-crested Turacos *Tauraco erythrolophus*, recently arrived on loan from Jersey Zoo, reared a single chick in their first year at Chester.

Our collection of pigeons continues to evolve and significant new arrivals in 1991 include a pair of Blue Crowned Pigeons *Goura cristata*. The male was received from Bochum Zoo in Germany and the female from Avifauna in Holland as part of the European EEP breeding programme for this species. Also we received three of the exquisitely beautiful Superb Fruit Doves *Ptilinopus superbus* also captive bred at Avifauna in Holland, four Pied Imperial Pigeons *Ducula bicolor* bred at Paignton Zoo, and a second pair of Common Bronzewings *Phaps chalcoptera* bred at the Tropical Bird Gardens, Rode. Our greatest disappointment was in not rearing any Pink Pigeons *Nesoenas mayeri* in 1991 although we reared two Pink-necked Green Pigeons *Treron vernans* and a Celebes Quail Dove *Gallucolumba tristigmata*, both for the first time at Chester.

One Spectacled Owl *Pulsatrix perspicillata* was bred but we were devastated by the death of the breeding female in late December. A female Milky Eagle Owl *Bubo lacteus* received to pair with our male on re-sexing was judged to be an immature male. Our breeding pair of European Eagle Owls *Bubo bubo* were stolen later in the year. That pair had earlier reared three youngsters. Two Great Horned Owls *Bubo Virginianus*, four Snowy Owls *Nyctea scandiaca* and sixteen Barn Owls *Tyto alba* were also reared. The Barn Owls, as in previous years were donated to the Keele University Barn Owl reintroduction project. A total of 98 chicks have now been bred for this project. In order to improve the owl accommodation by doubling the size of the present aviaries, it has been necessary to reduce the number of breeding pairs held. Nonetheless we received one significant addition in 1991 when as a result of re-organisation at London Zoo we accepted their single male Rufous Fishing Owl *Scotopelia ussheri*. This species is very rare in captivity and in the wild and we will make every effort to pair this bird. Should readers know of the location of other members of this species or of Vermiculated Fishing Owls *Scotopelia bouvieri* I would be obliged if they could assist.

After the death of a recently arrived but well established female Sparkling Violetear Hummingbird *Colibri coruscans* we agreed to send our male on loan to Slimbridge where they have previously bred these gorgeous birds. Hopefully we may again hold this species in the future if the pair at Slimbridge are successful.

Taking chicks for hand-rearing from the often unsuccessful nests of some of the smaller softbills in the Tropical House free flight meant more work for the keeper but success in rearing a Fairy Bluebird *Irena puella*, Silver-eared Mesia *Leiothrix argentauris*, and Red-eared Bulbul *Pycnonotus jocosus*. The preferred option of catching up recently fledged chicks and placing these in a large trap cage with one or both parents worked well for the White-rumped Shamas *Copsychus malabaricus* which reared a total of six chicks. Once the fledglings are placed in the trap cage they attract the parents which can then be trapped and the family held together until the chicks are fully independent. Similarly a Californian Quail *Lophortyx californica* which hatched twelve chicks also in the Tropical House free flight, was caught up together with her chicks and in the safety of an aviary reared ten of these.

Three Rothschilds Mynahs *Leucopsar rothschildi* were hand-reared. This was particularly important in that one of the parents was unrelated to all the other U.K. studbook stock having been

donated several years ago to Chester Zoo by a generous local aviculturist. In the Bird House the Purple Glossy Starlings *Lamprolornis purpureus* reared three chicks. New species to the collection included African Pied Starlings *Spreo bicolor* imported directly from Tygerberg Zoo in South Africa. Other additions in the year included Blue-eared Glossy Starlings *Lamprolornis chalybaeus*, Silver-beaked Tanagers *Ramphocelus carbo*, Oriental White-eyes *Zosterops palpebrosa* and Splendid Sunbirds *Nectarinia coccinigastra*.

Considering the larger softbills the most notable breedings included four Channel-billed Toucans *Ramphastos vitellinus*, one White Woodpecker *Leuconerpes candidus*, two Trumpeter Hornbills *Bycanistes buccinator*, three African Grey Hornbills *Tockus nasutus*, three Kookaburras *Dacelo novaeguineae* and a Red-billed Blue Magpie *Urocissa erythrorhyncha*. Two Red-billed Choughs *Pyrhocorax pyrrhocorax* were hatched in the incubator but although one chick was reared to over a month old it had failed to develop normally and was euthanized. The Great Indian Hornbill *Buceros bicornis* laid her egg outside the nest and the Wrinkled Hornbills *Aceros corrugatus* hatched two chicks but failed to rear them.

Mexican House Finches *Carpodacus mexicanus* after failing to rear chicks in 1990 reared over twenty chicks in 1991. Two pairs of Beavan's Bullfinches *Pyrrhula erythaca* were received and pairs of captive-bred Red-billed Fire Finches *Lagonisticta senegala*, Red-cheeked Cordon-bleu *Uraeginthus bengalus*, and Golden-breasted Waxbills *Amandava subflava* were presented to the Zoo.

At the end of the year some 300 chicks of over 70 species of birds had been reared. Again this was a reflection on the hard work, enthusiasm and commitment of the keeping staff.

#### REFERENCES

- KUNNERMANN, F & PERRY, J (1990). Hand-rearing the Caribbean Flamingo *Phoenicopterus ruber ruber* at San Antonio Zoo *International Zoo Yearbook*, 29, 95-99.

\* \* \*

## REPORT OF COUNCIL MEETING

The Society's Council met at the Rode Tropical Bird Gardens on Sunday 29th March, 1992, when thirteen Council Members were present.

The results of the members' questionnaire were discussed. Thirty-five had been returned (approximately 16%). Of these 40% had indicated they would be prepared to invite other members to visit their collections as a group and 76% had requested more social events. It was agreed such visits should be arranged when possible. In the case of several small collections being within the same area, a joint visit could probably be arranged and Mrs. Rosemary Wiseman and Mr. R. Grantham agreed to act as co-ordinators. Invitations and details will be circulated with the Magazine when appropriate. It was also agreed that a Social Secretary was necessary to arrange other events and Mr. K. J. Lawrence was appointed.

An encouraging number had indicated a willingness to give a talk and/or write articles for the Magazine, and these offers will be followed up. Although the majority of replies had indicated a willingness to take part in some form of register of birds for sale or exchange, Council decided not to pursue this at present as there is already a similar scheme in operation through the Foreign Bird Federation. Further consideration will be given to the possibility of producing a register of members, indicating their special interests.

Arrangements will be made to hold a Symposium in 1994, the Society's centenary year, and a sub-committee is to be appointed to organise this event under the chairmanship of Roger Wilkinson.

The Hon. Treasurer reported that the financial position was improving and he was now hoping that the standard of the magazine could be improved and that funds could be accumulated for the forthcoming centenary year.

The next meeting of Council will be on 6th September 1992.

\* \* \*

## NEWS AND VIEWS

The New Zealand Chatham Island Black Robin has increased recently to 116 specimens after declining to only five individuals a few years ago.

\* \* \*

Pairs of Palm and Leadbeater's Cockatoos and three Hawk-headed Parrots were stolen in February of this year from Chester Zoo. This is not the first occasion on which the Zoo has lost rare and valuable species in this way and some members may remember the theft of the Zoo's Birds of Paradise about twenty years ago.

\* \* \*

A pair of Rothschild's Peacock Pheasants has been presented by Hong Kong Botanical and Zoological Gardens to the San Diego Zoo on the occasion of the Zoo's seventy-fifth birthday. This species had never been kept in captivity when Delacour wrote "Pheasants of the World" but its successful captive breeding in "Malaysia or in Hong Kong under a co-operative agreement with Dr. K. C. Searle" was mentioned last year by Frank Woolham in his contribution to News and Views (*Avicultural Magazine* 1991, Vol.97:45).

\* \* \*

Ken Dolton's consistent success in breeding the endangered Thick-billed Parrot *Rhynchopsitta pachyrhynca* is well known. Regrettably the hen of one of his pairs died in January of this year as the result of an ovarian tumour. This particular pair was obtained for him from the San Diego Zoo in 1966 by E. Pariente, a dealer well-known at the time, at a cost of £90! The pair first bred successfully in 1973 when they produced two youngsters, as they did almost every subsequent year until 1989 when they were at least twenty-five years old. The cock is still alive and in good condition.

Incidentally, Pariente was the first importer into the U.K. of White Cockatiels of which he obtained four pairs from Mrs. Moon of Florida in whose aviary the mutation was established.

\* \* \*

Council member Malcolm Ellis has recently completed painting

many of the bird illustrations for the new edition of the *World Book International Encyclopedia* which is to be published soon. Many of our members will be familiar with his illustrations in *Birds of Prey of the World* by Philip Burton from which some of the original paintings are available for sale. Details may be obtained from Malcolm Ellis, The Chalet, Hay Farm, St. Breock, Wadebridge, Cornwall, PL27 7LH.

\* \* \*

Ed. Bish, Curator of Birds at Busch Gardens, Tampa, Florida retired in January of this year after working in the gardens since their opening 33 years ago. The bird collection is one of the largest in the U.S.A. and now contains about 2000 birds of 221 species. Several first breedings have occurred in the gardens, notably that of Lear's Macaw in 1982, and viable breeding groups of Yellow-collared Macaws, Maximillian's Parrots, Festive Amazon Parrots and Golden (Queen of Bavaria's) Conures have been established under Bish's supervision.

\* \* \*

Gouldian Finches were once abundant at waterholes in North-western Australia and often occurred in flocks of thousands. Now only two breeding populations are known neither of which exceeds 100 pairs. The main factor which has made the Gouldian Finch an endangered species, even if it were not responsible for the initial decline in their numbers, is the occurrence of a mite *Sternostoma tracheolum* which infests the respiratory system of the birds. An anthelmintic drug ("Ivomec") kills the air-sac mite and has been found in studies in captive birds to be effective in treating the condition. Accordingly a band of scientists and volunteers is embarking on an ambitious project, with financial help from the World Wide Fund for Nature, to try, with the use of the drug, to build up the number of birds free of the parasite and also to search for new breeding areas which can be made into Nature Reserves.

\* \* \*

*From Malcolm Ellis*

According to a report in an Australian newspaper there has been in Sydney over the past five years a population explosion of Sacred Ibis. This summer their numbers were increased by birds driven by

drought conditions from the country into the city. The species is now reaching plague proportions, according to a spokesman for the Environment Minister, who added that "people still like them in spite of their being a real problem." Graeme Phipps, Principal Curator of Taronga Park Zoo, considers that they are not a problem and that they fit quite well into the urban area.

The future of London Zoo has been assured after a year-long campaign against its threatened closure and plans to replace it with a theme park have been dropped.

After completing the article on Padstow Tropical Bird Gardens (*Avicultural Magazine*, Vol.97, 4: 174-178) in September I learned with regret that these delightful gardens would have to close.

Four birds of what is claimed to be an hitherto undescribed new species have, according to recent reports, been found in a bird exporter's cage in Dar es Salaam, Tanzania. The four, which subsequently died, were described as "members of the Bishop family", presumably, birds of the genus *Euplectes*.

A party visiting the Jozani Forest, Zanzibar, saw and heard the Zanzibar race of Fischer's Touraco *Tauraco fischeri zanzibaricus*. Endemic to that island and restricted to the Jozani area, it had not been recorded since 1937, and was thought possibly to be extinct. It is well known to the local people who call it *Jogoo Mwita*, 'cockerel of the forest', presumably because of its loud call. The party also saw the Green-backed Twinspot, recorded previously on Zanzibar only on three occasions, all in the 1930s. EAST AFRICA NATURAL HISTORY SOCIETY, *Bulletin*, 1991, 21, 4: 60.

At the end of March, Mike Reynolds wrote that 'Operation Chough' had five pairs of Choughs building nests at Paradise Park, Hayle, Cornwall.

\* \* \*

A five-year Kiwi recovery programme was launched last August by the New Zealand Conservation Department in association with the Royal Forest and Bird Protection Society and the Bank of New Zealand. Its management and research studies are aimed at maintaining and, where possible, enhancing the abundance, distribution and

genetic diversity of Kiwis. Already surveys in central and west coast areas of the North Island suggest that the Brown Kiwi has disappeared from small forest patches as well as from extensive areas in some of the National Parks where it was once fairly common. However, the species is still present in moderate numbers in some places near the Wanganui River and in Tongariro National Park. It has been found that many Kiwis are accidentally caught in possum traps or killed by dogs. However, a pleasing early result of the survey is the discovery that the species has adapted well to pine forests where there have been several Kiwi sightings in Northland.

\* \* \*

*Robin Restall writes*

"In a copy of Kukila (Bulletin of the Ornithological Society of Indonesia) I noted that the big Black-headed Mannikin *Lonchura atricapilla jadori* has been recorded as far south as Parepare in Sulawesi, well inside the range of the small Brown-headed Mannikin *L. atricapilla brunneiceps*. This casts doubt on the integrity of *brunneiceps* as a race of *atricapilla* and raises the possibility of its being a true species. This is a fine opportunity for an aviculturist to do a comparative study. I kept and bred the Timor Zebra Finch very successfully a couple of years ago and am convinced that it is not a race of the Australian Zebra Finch but is a good species in its own right. The problem of carrying out a comparative study is to obtain good Australian birds - the domesticated Zebra Finches freely available have become too modified to be reliable enough, I fear."

\* \* \*

In International Zoo News (No 233, page 48) James Osborne describes the comparatively new Territory Wildlife Park, Northern Territory, Australia. The Park is at Berry Springs about 40 miles south of Darwin along the Sturt Highway. Osborne writes enthusiastically about the new nocturnal house which accommodates some of the Territory's rarest mammals, the spacious enclosures displaying kangaroos and dingoes and the huge aquarium. He refers to the enormous walk-through aviary and to the billabong where Northern Territory species of ibis, storks, cranes and egrets can be seen from an elaborate hide. However, he does not even mention what to me is the most attractive and interesting feature of

the park, namely a group of about a dozen quite small (about 15 m x 15 m) aviaries each of which depicts accurately a different type of Northern Territory habitat e.g. rain forest, desert, grassland etc. These enclosures house an incredible number of Northern Territory species among which I saw, at a distance of only a few feet, a Spotted Bower Bird *Chlamydera maculata* in its bower, decorated mainly with white objects like shells and stones, displaying to a female. I remember particularly the Brown's, Crimson-winged and Hooded Parrots and also the Red-collared and Varied Lorikeets both of which were present in pairs in the aviaries and also in considerable numbers in the trees in the gardens. Apparently the Varied species is seen only during some of the dry season but the Red-collared Lorikeets are always there. Perhaps Rosemary Low had forgotten the Red-collared when she wrote in *Parrots Their Care and Breeding* that the Rainbow (Swainson's) is "the most beautiful of the genus" for it is completely outshone by the Red-collared with its bright, wide red collar and its uniformly intense orange-red breast. I thought I had persuaded successfully one of the birdkeepers, Tim Martin, to write an account of the collection at Territory Wildlife Park for the Avicultural Magazine but it has not turned up yet.

\* \* \*

Spix's Macaws at Loro Parque have hatched one chick which is being reared by the parents.

Ed.

\* \* \*

### THE SOCIETY'S AWARDS

The following are probably first breedings in the United Kingdom. Anyone who knows of previous breedings is asked to inform the Hon. Secretary.

African Grey Hornbill	Chester Zoo <i>Avic.Mag.</i> 1990, <u>96</u> , 167.
Buffon's Touraco	S.C.Horne <i>Avic.Mag.</i> 1991, <u>97</u> , 35.
Trumpeter Hornbill	Chester Zoo <i>Avic.Mag.</i> 1991, <u>97</u> , 67.
Ashy Starling	Chester Zoo <i>Avic.Mag.</i> 1991, <u>97</u> , 164.
Channel-billed Toucan	Chester Zoo <i>Avic.Mag.</i> 1991, <u>97</u> , 179

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*Rosemary Low*

Male Palm Cockatoo on exhibit at Palmitos Park, Gran Canaria.

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## PARENT-REARING OF A PALM COCKATOO AT PALMITOS PARK

By Rosemary Low

Captive breeding of the Palm Cockatoo *Probosciger aterrimus* is still a rare event, except in one very successful collection in the USA, where I believe all the young are hand-reared. Parent-rearing of this species is very much rarer. I would therefore like to record in detail our experiences during 1991 with one pair of the nominate race in the breeding centre at Palmitos Park, Gran Canaria.

They occupy an aviary which measures 8 m long, 2 m wide and 2.4 m high. Part of the roof and the front is constructed of welded mesh (14 g. 1 in. x 2 in.) and the walls are solid. At the back of the aviary an open-topped log rests on a solid base 67 cm above the ground. The log is about 1.2 m high with an internal diameter of 30 cm. The logs for the Palm Cockatoos are different from all other nests in the breeding centre in that they cannot be inspected from the service passage at the back of the aviary.

The first nesting attempt of the pair occurred in 1991. The single egg was apparently incubated only by the female. The date of laying was unknown but the incubation period in this species is 29 or 30 days. The egg hatched on 23rd April when a chick was heard at 5 pm. At 8 pm the female left the nest. Inspection revealed a dead newly hatched chick. It had been bitten on the top of the head. Perhaps the female had accidentally killed it when trying to feed it. Chicks which are purposely mutilated usually have more serious injuries.

We were disappointed but not discouraged. After all, the first breeding attempt had produced a live chick. We then installed an observation camera in front of the aviary. In July I witnessed copulation by this pair - the first time I had seen it in this species. Observation cameras, like television cameras, are remarkably efficient in even fading light and, thus, at 9 pm. one evening, I obtained via the monitor a photograph of the pair mating.

The female laid again in August, near the beginning of the month. The date was unknown as we kept disturbance to a minimum. On 3rd September I was excited to hear once again the sounds of a chick from the Palm's log. It was probably no more than one day old and from then on was heard frequently. Mr. Paulmann (founder of Palmitos Park), Mike Gammond (my partner and assistant curator of the breeding centre) and I were unanimous that the pair should be given the opportunity to rear the chick. It turned out to be the right decision.

I then had to decide what alterations to make to the diet. The pair eat mainly sunflower seed and walnuts, although every day their food tray contains a mixture of boiled maize, chopped fruits and chopped vegetables, such as carrot, zucchini and spinach. I believe that Palms are more likely to eat items such as zucchini and orange if they are presented in quite large pieces which can be held in the foot. When the chick hatched they were provided with unlimited amounts of fresh corn on the cob which was readily eaten. After a few days the fibrous orange fruits of an endemic palm *Phoenix canariensis* were available and these too were eaten. The supply lasted until the chick was three weeks old.

At that time a pomegranate *Granatapfel* tree nearby started to produce fruit. As most parrots relish pomegranates above all else, I offered some to the Palms. They were eaten with great enthusiasm. From that day on the pair consumed at least two pomegranates daily during the rearing period. When the tree finished fruiting, we bought pomegranates by the caseload. I suspect that they played an important part in the rearing of a healthy and very beautiful young Palm Cockatoo.

The nest was not checked very often until the chick was about one month old. The chick could be heard and the female was always in the nest with it. On 22nd September (at 19 days) the young Palm was ringed (12 mm internal diameter), weighed and photographed. From then on I weighed and photographed it every Sunday until 3rd November. The weights are recorded in Table 1 and are compared with those of a Palm Cockatoo which was hand-reared in another

collection. The bird was weighed when its crop was usually about half full. These weights clearly demonstrate the superior early growth rate of a parent-reared young one. Palms are notoriously difficult to hand-rear from the egg and many die when fully feathered, but before independence, even in very experienced hands.

However, a search of the limited amount of literature regarding parent-rearing shows that this, also, is not without its problems. I was therefore very relieved that the rearing of this youngster progressed so well. I believe that the female stopped brooding it when it was about one month old, even at night, but cannot be certain on this point. When the female left the nest she always stayed in the semi-enclosed part of the aviary at the side of the nest which was not covered by the observation camera.

Age in days	Parent-reared	Hand reared
	Weight in grams	
19	288	76
26	430	160
33	545	c 260
40	598	c 380
47	610	482
54	610	c 520
77	Left nest	
Six months	615	<---Fully independent--->

*Weights of two Palm Cockatoo chicks in different collections*

TABLE 1

While the young one was in the nest, branches were occasionally provided to allow the male to add more nesting material in the form of long splinters chewed from the branches. Palm Cockatoos always add these to their nest, gradually increasing the height of the structure on which the egg or chick rests. In this respect, they are unique among the cockatoos. As Palms always use an open-topped nest it is said to be a precaution against flooding. However, it also ensures that the nest interior remains clean. By 20th October the nest structure was only 15 cm from the top of the log. In case this caused the young Palm Cockatoo to leave the nest prematurely, some of the material was removed so that the level was 30 cm below the top.

Towards the end of October I sometimes saw the young one looking out. On 5th November she was standing on top of the nest with her father. The male screamed angrily when he saw me, as though warning her to retreat from danger. On this occasion she did not but on several future occasions she gradually disappeared downwards into the log when the male screamed a warning. On 18th November, when she was 76 days old, she finally left the log and in the morning she was sitting on the aviary floor. She was fully feathered and almost as large as her father. She soon climbed to a low perch. The following day, and on two or three occasions during that week, I watched on the monitor as the male fed her. However I did not see this again until late January, because the observation camera was not operating for a couple of months. Three days after leaving the nest the young one was sitting on a high perch which can be reached only by flying. Her flight was strong and confident. She was first seen feeding herself about one month after leaving the nest but probably did so before. From the beginning of January, I could observe the three birds via the monitor again. It was very noticeable how the young one was always with her father. Often the female was alone at the back of the aviary. They were most active in the hour before sunset until just before it became dark. It is interesting that Wood (1988) observed them "flying about on calm moonlit nights" in the Cape York Peninsula, Australia.

The female appeared to be afraid of her offspring, always flying off when she approached closely. At the beginning of February, I started to observe again the male feeding his daughter and also what appeared to be increasing animosity between her and her mother. On 15th February I noticed for the first time slightly aggressive behaviour on the mother's part when she lunged at the young one and sent her flying. On the following day the male was again feeding his daughter and, unusually, the female was on the other side of the male. She approached him as though she, too, wished to be fed. There was no doubt in my mind that the female was becoming very jealous of her daughter. Perhaps she also wanted to nest again. The young one was therefore removed from the parents' aviary on 18th February.

I refer to the young one as a female without actual proof. Her small beak suggests femininity as also does her close relationship with her father. Wood (1988) observed an interesting incident when a young one in the wild left the nest for the first time. The young one was a male. Immediately after leaving the nest, it flew approximately 15 m and landed awkwardly near the male. It was

immediately attacked by the male and knocked off the perch. Until the next nesting season the young bird would return to the nest site with his parents but always at a distance from them.

The appearance of our young Palm Cockatoo differs from that of the adults in the following respects. The plumage is blacker, presumably because the powder down feathers are not yet growing (it is the powder from these feathers which lightens the black plumage to dark grey). There are a few faint narrow whitish-yellow bars on the feathers at the sides of the breast - a variable feature of immature plumage. The skin surrounding the eye is white (grey in adults), the lower mandible is whitish and the upper mandible is grey with the culmen and edges white.

The Palm Cockatoo is now the subject of an EEP which is, a special European breeding programme initiated by zoos to try to conserve selected rare species of birds and animals. A co-ordinator is appointed for each one and it is his job to try to persuade all those who hold the species to register them so that they become part of the programme. Surplus birds are moved around where required, special attention being paid to the genetics of individuals to avoid inbreeding and to maximise the number of birds contributing to the gene pool. One problem in breeding some of the rarer parrots is that a few very successful pairs dominate the gene pool but the vast majority of imported birds never breed and thus the founder stock is actually very small. Programmes such as these can help to correct this problem. The co-ordinator for the Palm Cockatoo EEP is Dr. Roger Wilkinson, North of England Zoological Society, Upton, Chester, CH2 1LH, England. I urge everyone who keeps this species to contact him.

To date, very few successful breedings of this cockatoo have been recorded in Europe. By "recorded", I mean published accounts or reports in *The International Zoo Yearbook*. The only successful breedings of which I am aware are as follows: Germany: Leipzig Zoo, Zoo Neuweid and Dr. R. Peters; U.K.: Birdland (Bourton-on-the-Water), Mr. and Mrs. R. Mann/G. A. Smith and Mr. and Mrs. H. Sissons. If anyone else has been successful, I should be most interested to obtain the details.

#### REFERENCE

WOOD, G. A., 1988, Further field observations of the Palm Cockatoo *Probosciger aterrimus* in the Cape York Peninsula, Queensland *Corella*, 12 (2): 48 - 52.

## A TRIP TO AUSTRALIA

By Fred Barnicoat  
(Johannesburg, South Africa)

I was enabled to visit Australia in March, 1991, through a kind invitation from the Avicultural Society of Southern Tasmania to be one of the speakers in the 6th National Avicultural Convention. Australia had always seemed to me to hold the most attractive prospects for a bird enthusiast. The reality of a short visit proved even more enthralling than I had ever anticipated.

My first days were spent in Hobart. Here in the lovely garden of Don and Gwenda Coombe, I gained my first insight into the wonderful privilege of viewing Australian birds in the wild state. Green Rosellas *Platycercus caledonicus* and the Tasmanian subspecies of the Eastern Rosella *Platycercus eximius diemenensis*, with strikingly larger white cheek patches, settled every day in the trees in the garden, and here I encountered the first of the many species of Honeyeater I was to see over the next three weeks.

On short drives out into the countryside a spectacular and frequent sight was the Flame Robin *Petroica phoenicea* usually sitting in full view on the wooden posts in the fences around the sheep and apple farms. Little flocks of Superb Fairy-Wrens, *Malurus cyaneus*, the males by now fast going into their winter eclipse plumage, were often to be seen flitting in the grass at the side of the roads, and the Dusky Wood Swallows *Artamus cyanopterus* sitting on fence or telephone wires or indulging in their batlike flight over the meadows.

In Don's garden, too, I gained the first taste of how much thought and money Australians are prepared to put into the construction of their aviaries. The entire perimeter was constructed with an opaque but translucent material and the top metre or so of each side was angled inwards so as to help shed the strong and cold winds prevalent here at times. The inclusion of sliding windows at intervals around the whole structure allowed for viewing the inmates of both the very large and the smaller aviaries within, with the minimum of disturbance to the inmates. Among the species breeding well in groups of several pairs in the large aviary were the Painted Firetail *Emblema picta*, the Green Avadavat *Amandava formosa*, the Orange-breasted Waxbill *Amandava subflava*, the Firefinch *Lagonosticta senegala*, the Cordon-bleu *Uraeginthus*

*benegalus*, the Common Waxbill *Estrilda astrild*, the Rufous-backed Mannikin *Lonchura bicolor nigriceps* and the Orange-cheeked Waxbill *Estrilda melpoda* among others. The Melba Finch *Pystilia melba* is kept only one pair to an aviary as two males are usually aggressive towards each other, and the Australian Crimson Finch *Neochmia phaeton* is kept as only single pairs to a small aviary shared with one pair of Grass Parrakeets.

I was to see numerous further examples of the idea that many Australian and African finches are best housed in small flocks to stimulate breeding activity. I was highly impressed by the excellent results Australian breeders are achieving with their indigenous and a limited (yet surprisingly large) number of exotic finches in large, outdoor, planted aviaries that are aesthetically very pleasing. No foreign birds have been legally able to be imported into Australia since 1939, and I must say that I was deeply impressed to see many of the species I know in South African aviculture readily available at quite reasonable prices in Australia and in no way inferior in colour and size to the very limited stock that must have been imported over 50 years ago and can have had the benefit of the infusion of little, if any, new blood. The existing Australian stocks are also steadier and more ready to reproduce their kind after many generations of captive breeding.

For me the greatest highlights were the Australian stocks of Red-headed Parrot Finches *Erythrura psittacea* and Red Siskins *Carduelis cucullata*, breeding prolifically in large, well planted aviaries outdoors. These stocks seemed sturdier and better coloured, and I think would prove better breeders, than those that I have ever been able to import from Europe.

I was even more surprised by various weaver species that have been established in Australian aviaries, and staggered by the small stock of Pin-tailed Whydahs *Vidua macroura* propagated in huge planted aviaries containing numerous pairs of the host species, the Common Waxbill, on which they parasitize their young.

As my time in Australia progressed I became increasingly impressed by widespread breeding results with an excellent standard of a good variety of birds. In only one respect did a fear spoil this favourable impression. The predilection for mutant forms, fanned by the huge monetary profits that seem possible, which is currently rampant in aviculture worldwide, is now coming to the fore in Australia too, and I dread it may prove much to the detriment, if not to the total destruction, of the maintenance of the stocks of pure bred forms. This is a little surprising in a country

where bird breeders in general have been meticulous about preventing the different Grassfinch or *Lonchura* species from cross-breeding. I would wish that all species being bred in Australia could be of the same high standard and as untainted by a confusing plethora of colour mutations as the Cuban Finch. The happy situation is that Australia has the biggest and best stock of aviary-bred Cuban Finches in the world and is a very valuable source from which sound stock can always be obtained.

Of course most of my time in Hobart was taken up with the well organised Convention. I suppose it is true of all such avicultural conventions, as it certainly was of this one, that one gains far more from them than one is in a position to give, and I found it a very informative and enriching experience. It had a strong "conservation theme" running through it, and the key speaker was Don Marton, the Chief Wild Life Officer of New Zealand. In the opening address he gave examples of where captive breeding programmes have been successfully used to save critically endangered species, and he is the first nature conservation officer whom I have ever heard to pay tribute publicly to the valuable expertise aviculturists are beginning to command, and to view our efforts with anything but disdain and accept that we can play a valuable part in saving some endangered bird species for future generations to see.

Next Peter Brown, a member of this society from long ago, and now Director of the Governmental Breeding Station for the highly endangered Orange-bellied Grass Parrakeet *Neophema chrysogaster*, reported on some encouraging breeding successes, somewhat counteracted by the outbreak of a disease. By far the greatest privilege extended to me while in Australia was the chance to view this breeding station and see the rare birds at close quarters a few days later. It contained two impressive blocks of aviaries entirely separated as a precaution for the spread of disease. Different aviary design was used in the two sections, in the one the entire front of the aviaries being curved with the aim of trying to prevent the birds from killing themselves by flying into the roof or end of the aviary if they panic. An impressive earth mound wall has been constructed on one side of the station to cut the cold winds and this wall has resulted in improved results with the Orange-bellied Grass Parrakeets. Great attention has been paid to security fencing to keep out predators like possums as well as two-legged ones. All the protective measures in use here are indicative of the priceless value placed on the rare birds housed within. There was a strong feeling

among some of the bird breeders at the Convention that the time had come when some pairs of the Orange-bellied Grass Parrakeets should be spread among a few selected private breeders, so that all the eggs should not be kept in the one basket so to speak. They argue that private breeders have an excellent record of breeding success with all the other *Neophemas* and feel that the Orange-bellied would soon be thriving just as well. However, it seems extremely unlikely that the Government will permit such a step with so critically endangered a species - a pity, I think.

Dr. Gerard Karl, world renowned in the field of avian veterinary science, had come from Holland. He delivered two papers, one of which was on the ultra-susceptibility of specific colour mutants of psittacine birds to certain diseases, while Dr. Louis Filippich, a lecturer in veterinary science from the University in Brisbane, stressed the importance of sound aviary design in keeping birds healthy and of hygienic aviary practices on an on-going basis as a necessity of restoring birds to health after an outbreak of disease: that the mere dosing with medicines to overcome a disease problem is never sufficient *per se*, was his theme. I gained the impression that the application of veterinary science specifically to birds is well advanced in Australia, undoubtedly more so than in South Africa.

Peter Oderkerken gave an interesting address on lorikeets, of which he is currently breeding all seven Australian species with great success. He is particularly interested in observing and photographing birds in the wild, and a recent spell spent in New Guinea, primarily on business but with bird-watching as a major sideline, enabled him to share observations of species such as the Dusky *Pseudeos fuscata*, Fairy *Charmosyna pulchella* and Musschenbroek's *Neopsittacus musschenbroekii* in the wild. His witty lecture was illustrated with excellent slide material as indeed were all the lectures delivered at this Convention.

Numerous other lectures were given on a wide variety of birds or groups of birds e.g. Blue Mutation Scarlet-chested Grass Parrakeets, Conures, African Estrildine species, the Serins or Wild Canaries, Weavers and Whydahs, Softbilled Birds, Breeding Doves and Pigeons etc. There were two lectures going on simultaneously throughout the convention so that people could select the topic in which they were likely to be the more interested.

In order to advance the theme of aviculture as an aid in conservation attractive T-shirts were sold by the Australian Federation of Aviculture depicting the Red Siskin and highlighting the World

Conservation Programme of this species. The Red Siskin was an appropriate symbol to choose for this purpose, the more so because the Australians have managed to perpetuate a stock of these ultra-rare birds that is virile, pure and of superlative quality.

A weekend spent in the beautiful city of Sydney allowed time only for visits to Taronga Park Zoo and the private aviaries of the well known avicultural author, Stan Sindel. Taronga must command more breathtaking views than any other zoo in the world. The birds were extremely effectively presented (as are all the exhibits) in large, well planted aviaries with an attempt to match birds with their natural habitat e.g. the "desert aviary", the "grassland aviary" etc. ranging right up to the "rainforest aviary" in which one would find amongst other birds a magnificent pair of Noisy Pittas *Pitta versicolor* and Black-breasted Button-quail *Turnix melanogaster* to utilise the ground space. Breeding results must be very good here. I found the same high standard of presentation at Currumbin Bird Sanctuary, and I wondered if the careful thought so many private bird fanciers put into the construction of their aviaries may sometimes have been inspired by the good example put forward by the public displays of birds.

Stan Sindel must be a very hard working man to keep pace with such a huge set-up single-handed. I enjoyed seeing all the Australian Lorikeets breeding well, and some of the new mutations he has established in his aviaries are beautiful. Then he has a good collection of cockatoos including a couple of the black species and he does well with some of the parrots that are rare in aviaries such as the Golden-shouldered *Psephotus chrysopterygius* and Northern Rosella *Platycercus venustus* as well as the Double-eyed Fig Parrot *Cyclopsitta diophthalma*, which he has pretty well mastered by now. All this has been well described already in magazines and Stan's own excellent books for the specialist breeder, so what did come as a especial surprise to me was his success with a number of large softbill species. He had just bred the Green Catbird *Ailuroedus crassirostris* in an aviary of quite modest dimensions and I appreciated being able to see this bird and its offspring at close quarters. He had also had success with the Satin Bowerbird *Ptilonorhynchus violaceus* and the Regent Bowerbird *Sericulus chrysocephalus*.

The greatest proportion of my time was spent at the home of Peter Oderkerken at Buderim, 150 km north of Brisbane. I owe my friendship with Peter to this Society. Over 20 years ago we were fellow members and in those days it was possible to publish a list

of the names and addresses of every member annually, through which he visited me in Johannesburg as a very young man embarking on his first trip around the world. Another practice of the Avicultural Society that I am so sorry has fallen away was the recording in that list of the year when each member had first joined. Some of the dates went right back to the last century and it gave each member a real feeling of belonging to an amazing group of enthusiasts.

Lorikeets predominate in Peter's own collection but it was the wild parrots that came at frequent intervals into his lovely garden and fed from a bird-table that held me enthralled. First to arrive were a pair of King Parrots *Alisterus scapularis* in all their glory, followed by Pale-headed Rosellas *Platycerous adscitus*, innumerable Rainbow Lorikeets *Trichoglossus haematodus*, fewer Scaly-breasted Lorikeets *Trichoglossus chlorolepidotus*, Sulphur-crested Cockatoos *Cacatua Galerita*, a Yellow-tailed Black-cockatoo *Calyptorhynchus funereus* and a Laughing Kookaburra *Dacelo novaeguineae*. I was soon taught the difference between the three spectacular black and white birds that were all present in the garden - the Australian Magpie *Gymnorhina tibicen*, Pied Butcherbird *Cracticus nigrogularis* and Magpie-lark *Grallina cyanoleuca* or "Pee-wee" and was subsequently to find them commonplace wherever I went. Doves common in the garden were the Crested Pigeon *Geophaps lophotes*, the Bar-shouldered *Geopelia humeralis* and the Spotted or Laceneck Turtle-dove *Streptopelia chinensis*, the latter being an introduced species.

I was taken by car on a 4,000 km trip westwards across Queensland as far as Charleville, where I was thrilled by the sight of Mallee Ringnecks or Barnard's Parrakeets *Barnardius barnardi* feeding in the trees along the banks of the Warrego River. It is impossible to mention all the Australian birds I saw for the first time or all the thrilling experiences of seeing birds well known to me in captivity in their natural habitat. I loved passing through the little Australian towns in which everyone you met was so friendly and a few memories stand out: The large flocks of Sulphur-crested Cockatoos, which often settle on the tarmac roads where they stand out vividly against the dark grey background; huge flocks of Galahs *Cacatua roseicapilla*; the large number of Sulphur-crested Cockatoos and Little Corellas *Cacatua pastinator* feeding around a grain silo in the centre of Moura; the striking red of the underparts of Blue Bonnets *Northiella haematogaster*, showing up so vividly against the brown earth background of a country roadside near Roma; the

beauty of a Blue-faced Honeyeater *Entomyzon cyanotis* quietly perched in a small shrub at a garage on the main highway near Gympie; the Dollarbird *Eurystomus orientalis* of a lovely turquoise colour with mauve throat and striking silver dollar marks on the wings when he flew off at the Carnarvon Gorge National Park; King Parrots and Crimson Rosellas *Platycercus elegans* feeding from my hand and Red-browed Finches *Aegintha temporalis* around my feet at the Bunya Mts National Park, the vivid red and black of the Red-backed Fairy Wrens *Malurus melanocephalus* flitting in reed beds in many places in Queensland - a sight rather reminiscent of the Red Bishop Bird *Euplectes orix* of my own country, but the Fairy-Wrens are far daintier; the noisy flocks of Apostlebirds so commonly to be seen in the bushes along the sides of the road, but not always to be counted in twelves as legend would have it! and so on and on. Apart from the Red-browed Finches the only other Australian Finches I managed to identify in the field during my very short stay was the Zebra Finch *Taeniopygia guttata*, of which we traced a nest containing babies, the Double-barred Finch *Taeniopygia bichenovii* and the Chestnut-breasted Finch *Lonchura castaneothorax* which was common in reed beds. It is the parrot-like birds that are so spectacular in the wild in Australia, like the Crimson-wings *Aprosmictus erythropterus* whose vivid beauty as they moved about in trees right on the edge of a main highway I found absolutely stunning.

One of the special interests of Peter Oderkerken is the literature relating to the Paradise Parrot *Psephotus pulcherrimus*. We enjoyed discussing the characters who are inextricably linked with that tragic saga, and I found it a strangely moving experience to go to many of the landmarks that are etched into the story - the Darling Downs where Gilbert discovered the Paradise Parrot in 1844; the enormous cattle stations of Fairfield, where C. Barnard found the bird common in 1882, and of Manar, where Cyril Jerrard took the one and only photograph in March 1922; Gayndah railway station, where Chisholm had to get off the train and proceed by horse and cart to visit Jerrard for the last "field study" of the Paradise Parrot that was ever possible; rivers where it was sighted, the Dawson, the Burnett and the Boyne, and the towns Taroom, Roma and Eidsvold. On one of my last days in Australia I had the honour of being taken to the Queensland Museum in Brisbane and introduced to the ornithologist, Wayne Longmore, recently returned from the sensational field expedition on which his colleague, Walter Boles, the Collection Manager of the bird department of the Australian Mu-

seum in Sydney, had picked up the body of a Night Parrot *Pezoporus occidentalis*, the first to be discovered for 78 years! I had the great privilege of being taken behind the scenes and shown not only this skin but also the collection of 12 Paradise Parrot skins, which is probably the largest to be seen anywhere in the world. It was like standing before the holy shrine to a bird that none shall ever see again. The shining brilliance even in those somewhat faded skins bore mute and agonizing testimony to what a truly magnificent bird the Paradise Parrot must have been in bush and aviary. The almost certain knowledge that if only a tiny fraction of the depth of aviculturists and their expertise that now exist had been there at the dawn of this century, the Paradise Parrot would have been alive and well and breeding in aviaries as prolifically as I had frequently seen its closest relatives the Hooded and the Golden-shouldered doing over the past few days.

A brief visit to the huge commercial breeding set-up called Bonza Birds, which is at Caboolture, proved to me the huge variety of breeding achievements possible in Australia. I saw species as diverse as the Black-breasted Button-Quail *Turnix melanogaster*, Rose-crowned Fruit Dove *Ptilinopus regina* and Superb Fairy-Wren *Malurus cyaneus* breeding well in the aviaries, the latter, alas, being curtailed because there is an inadequate market for the offspring in Australia!

As I watched the coastline of Australia receding into the distance as my plane flew westwards from Perth, I hoped I might one day be lucky enough to return, for this is truly a country *par excellence* for any bird lover.

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## BIRDS OF MADAGASCAR

By Caroline Harcourt  
(London)

Madagascar's avifauna is relatively impoverished, not only in comparison with the continental bird communities of countries at the same latitude, but also in comparison with those on the other large tropical islands, Borneo and New Guinea. For instance, Zambia, similar in size and latitude, contains 732 bird species while Borneo has around 550. This is in comparison to the mere 256 species in Madagascar, of which 201 (including three introduced species) are resident. However, a very high proportion of the Malagasy species are limited to the island. There are 105 endemic species (53%) and a further 25 species are restricted to the Malagasy Region which includes the Comoros, Mauritius, Réunion and their satellite islands as well as Madagascar itself (Langrand, 1990). Almost 25% of the genera are endemic, while three families are restricted to the island and two others are limited to the Malagasy Region. The affinities of Madagascar's avifauna are primarily Afro-tropical but certain species, including the White-browed Owl *Ninos superciliaris*, the Madagascar Starling *Hartlaubius auratus* and the Madagascar Bulbul *Hypsipetes madagascariensis*, belong to the Oriental region.

The vast island of Madagascar, the fourth largest in the world, has been isolated for at least 120 million years and it is this that has meant that many of the species found there occur nowhere else in the world. Humans arrived on the island only 2000 or so years ago but they have had an enormous impact on the original, mostly forest, vegetation. Now less than 20 per cent of the island is forested and this too is vanishing fast. Indeed it has been estimated that if the present rate of destruction continues, only the rain forest on the steepest and most inaccessible slopes will survive the next 35 years (Green and Sussman, 1990). Needless to say, the fauna of the island is disappearing along with the habitat. First to go of the birds were the giant flightless species belonging to the genus *Aepyornis*. Described, albeit somewhat inaccurately, by Marco Polo as "so huge and bulky that one of them can pounce on an elephant and carry it up to a great height in the air", they must, nevertheless have been an impressive sight. All that remains of them today is fragments of their eggs or the rare whole egg, seven

times the size of that of an ostrich.

There are, presently, more species listed in the Red Data Book of threatened African birds (Collar and Stuart, 1985) for Madagascar than there are for any other African country. Of the 28 listed, all but the Madagascar Heron *Ardea humbloti* are found only in Madagascar. A further 12 Malagasy species are given as 'near-threatened'. One species that may well now be extinct is the Snail-eating Coua *Coua delalandei* which was last seen with certainty in 1834 (Greenway, 1967). This species was known from an island, Ile Sainte Marie (now Nosy Boraha), off the east coast of Madagascar, but here its rain forest habitat has long since been entirely cleared. There is only a remote possibility that it might be rediscovered on the mainland. It was thought that both the Red-tailed Newtonia *Newtonia fanovanae* and the Madagascar Serpent Eagle *Eutriorchis astur* might also be extinct as neither had been seen since the early 1930's (Collar and Stuart, 1985). However, both are reported to have been re-found in the last few years. The Newtonia was rediscovered in late 1989 in southern Madagascar by members of the Chicago Field Museum and early the next year was seen in rain forest on the mainland opposite Nosy Boraha. It is a cryptic, canopy dwelling species, but now that its distinctive loud call has been recorded it has been reported from several other locations.

Two biogeographical regions - Eastern and Western - are described in Madagascar (White, 1983). The Eastern Region is divided into four vegetation zones or Domains : Eastern, Central, High Mountain and Sambirano, while the Western Region is divided into Western and Southern Domains (Figure 1).

The Eastern Domain consists of lowland primary rain forest, which once extended all along the eastern coast up to an elevation of about 800 m. The botanical composition of this area is rich and diverse with high levels of endemism. However, almost all of this forest has now been cleared, the only large tracts remaining are around the Bay of Antongil. The Central Domain at 800 - 1300 m, rising to 2000 m in some places, contains moist montane forest which is also rich in species. Most of this, though, has been transformed into grassland savanna, the largest area of forest remaining is that on the Masoala Peninsula. The High Mountain Domain has less diverse vegetation and the forest canopy is somewhat lower than that of the moist montane forest. It is very susceptible to fire damage. The Sambirano Domain is another area of moist forest, but is of limited distribution in the north-west of the

island. The forests in the Western Domain are dry and deciduous, with some of the trees in the area staying green for only four months of the year. Much of this forest has been cleared by fire for increased cattle grazing and cultivation or has been cut to make charcoal. Finally, the Southern Domain is very dry, the area is often referred to as spiny desert as many of its drought-adapted plants resemble cacti.



*Sketch map showing the vegetation Domains and places mentioned in the text.*

Figure 1

The Eastern Region harbours the greatest diversity of birds. There have been 165 nesting species recorded here, of which 42 are found nowhere else (Langrand, 1990). There are two threatened water birds confined to Lake Alaotra in this area, the Madagascar Pochard *Aythya innotata* and the Alaotra Little Grebe *Tachybaptus rufolavatus*. The former is on the edge of extinction because of the alteration of its habitat and to intensive hunting. Thirty-six species of forest birds are restricted to the region, all but one are endemic. These include the endangered Serpent Eagle, the rare Brown Mesite *Mesitornis unicolor* and the Short-legged Ground-roller *Brachypteracias leptosomus*. This latter species is considered rare by Collar and Stuart (1985) but it is possible that it is merely shy and therefore not seen very often. Most of the 11 Malagasy forests listed in Key Forests for Threatened Birds in Africa (Collar and Stuart, 1988) are in this eastern area and it is certainly critically important to the conservation of birds in Madagascar.

The Western Region contains 145 resident, non-marine bird species. Most of these (131) frequent the Western Domain, though only eight live there exclusively (Langrand, 1990). These eight species are all bound to the lake habitat and are threatened by the transformation of the wetlands into agricultural land, the introduction of exotic plants and fishes into the lakes, poaching, nest raiding and hunting. Hunting of some species is legal in Madagascar, but there is generally poor control of the sport and many of the hunters do not even know which species may be legally shot. The forest species found within the western domain have limited or fragmented ranges. For instance, Appert's Greenbul *Phyllastrephus apperti*, which was discovered as recently as the early 1970's, is found in only two contiguous forests near Sakaraha in the south of the country. These, and other forests in the area, are particularly threatened by fires, cattle causing damage to the undergrowth and illegal exploitation of the forest resources.

In the Southern Domain, 118 species have been recorded with 11 found only there. Three of the exclusive species are marine and the other eight are forest-living. Two of the forest species, the Subdesert Mesite *Monias benschi* and the Long-tailed Ground-roller *Uratelornis chimaera*, are restricted to a narrow strip of forest about 200 km long running parallel to the coast northwards from Tuléar (now Toliara). Each belongs to a monospecific genus and are representatives of families that are endemic to Madagascar. They are both terrestrial species so are threatened by dogs and rats as well as by habitat destruction. Both are listed as rare by Collar

and Stuart (1985).

Madagascar has one of Africa's oldest protected area systems, it was initiated in 1927. Almost 2% of the country is protected with most of the different forest environments, except mangroves, being covered. However, none of the wetland areas are included in the system. The national parks and some of the special reserves are open to visitors who have permits (easily obtained), but access to the strict nature reserves is more restricted.

The protected area system of the Eastern Malagasy Region consists of four national parks, seven strict nature reserves, fourteen special reserves and a biosphere reserve, a total of 26 sites covering an area of about 7,100 sq. km. Little forest outside the protected area system remains. In the Western Domain, there are three strict nature reserves and seven special reserves, while in the Southern Domain there are two strict nature reserves, two special reserves and one private reserve. These 15 protected areas in the Western Region cover an area of approximately 3,950 sq. km.

Langrand, in his recently published Guide to the Birds of Madagascar, has recommended 17 sites for observing the country's birds, the areas he suggests are all comparatively easy to reach. The reserve with the greatest number of birds recorded (110) is Analamazaotra, more commonly known as Périnet, in the east of the country. Its other major advantage is that it is easily reached all year round, either by an approximately three hour car trip from the capital or on a train that takes about five hours and runs daily from Antananarivo. Several threatened species can be found here including both the Short-legged and Rufous-headed *Atelornis crossleyi* Ground-rollers, Pollen's Vanga *Xenopirostris polleni* and the Yellow-bellied Sunbird *Neodrepanis hypoxantha*. The Madagascar Serpent Eagle has been reported from Analamazaotra, but given the numbers of visitors to this area, many of whom are ornithologists, it is extremely unlikely that it has been overlooked there. The rapidly deteriorating state of the forest is undoubtedly the cause of its disappearance.

The second area that is very commonly visited by tourists is the private reserve of Berenty in the south. Here 98 bird species have been recorded and, as this is an area of comparatively open forest and spiny desert, the birds are a lot easier to see than they are in the eastern rain forest. One of the more spectacular birds that is commonly seen is the terrestrial Giant Coua *Coua gigas*. Although fairly secretive, this species is not shy and can be easily watched as it feeds on the forest floor. At night, both the Malagasy Scops Owl

*Otus rutilus* and the White-browed Owl are frequently heard and can be seen fairly easily. The guides in this reserve will often show you the owls' daytime resting sites as well.

In conclusion, Madagascar is a must for all bird watchers who want to see species that they will not see elsewhere, though not a country to visit if you merely want to tick a large number of birds. Of course, you will also see many other unique species of flora and fauna on this giant island. Best known are the lemurs and the largest of these, the Indri *Indri indri*, lives at Périnet, while the enchanting Ring-tailed Lemur *Lemur catta* is impossible to miss at Berenty.

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## CAPTIVE BREEDING OF THE PURPLE-CRESTED TOURACO

By Françoise Raison  
(Broadway)

The first time I saw a Purple-crested (Violet-crested) Touraco *Musophaga porphyreolopha* it was hopping from branch to branch, in its unique flashing display, not in an African rain forest, but at Battersea Zoo. You would have to travel five thousand miles to see these birds in their natural habitat which is mostly south of the Sahara, although, interestingly, some touraco fossils have been found as far north as Bavaria.

Touracos belong to the family *Musophagidae* which means plaintain or banana eaters. (My touracos are always very keen to pick at banana pieces and swallow them greedily.) The touracos of the genus *Musophaga*, which includes the Purple-crested, live on the edge of the rain forest, in the tropical woodland of south-east Africa from Mozambique to South Africa. In a book just published by the Botswana Bird Club, ornithologists report observing a few Purple-crested Touracos in the eastern valleys of Botswana. Their attention was drawn to them by their call, a long sequence of notes starting quietly and reaching a noisy, repeated, crescendo of "kerkerker kok-kok-kok". Some zoologists consider that the Purple-crested forms a link between the dark violet touracos *M. rossae* and *M. violacea* and the green touracos *Tauraco persa* and *T. leucotis*. Their close relationship has been confirmed by karyology i.e. the study of their chromosomes.

The Purple-crested or Violet-crested Touraco is known by the scientific name *Musophaga porphyreolopha*. It has a large blue crest with a purple sheen contrasting with the brilliant glossy emerald green of its forehead. The bill is black, the nape is violet black turning to dark green as also are the mantle, the wing-coverts, and the tail. The thighs are pale bluish-slate. The feet are dark, strong and zygodactylous. The brown, bright and observant eye is surrounded by a red ring. The colour of the breast differentiates it from its relative, *M. p. chlorochlamys*. As its scientific name indicates *M. p. chlorochlamys* has an olive green breast and abdomen blending with the green sheen of the wings and tail, whilst *M. p. porphyreolopha* shows a pink brown tinge on the breast and back. *M. p. chlorochlamys* is found mostly in a Zambezi valley and

often inter-breeds with its ochre-bellied relative.

My chick was bred from a *chlorochlamys* cock mated to a hen of the nominate race. Although both birds were originally captured in the wild, the hen came from Raymond Sawyer in London and the cock from Servion Zoo in Switzerland. There is virtually no difference between the sexes. However, I noticed that the hen's crest and neck appear thicker than the male's.

In 1987 I tried to keep the two touracos together in an aviary. They had to be watched very carefully since they fought constantly. The hen, which was bigger and older, was terribly aggressive and without doubt the dominant partner. She would chase the cock mercilessly and drive him into a corner preparing to tear away the feathers on his back with surprising viciousness. For a year I attempted unsuccessfully to leave them together. I divided their inside flight where I left their food and where each bird had a lamp controlled by a time clock to provide light in the night and heat in the winter. The birds flew outside on alternate days and were constantly in sight of each other. In April 1987, when the weather was warmer, I let them fly together for longer periods and provided them with an escape box on the ground. It consisted of a large box with two holes cut at each end to enable the frightened bird to get in and escape from its partner.

Then the male's behaviour changed. He began to preen himself arrogantly, called frequently and loudly and turned on his hen whenever she began to show any signs of aggression. He became the dominant partner, displaying by flicking his tail up and down, raising his crest, and reaching upwards with his head before turning it from side to side. He fed the hen by regurgitation, then jumped on her back and they mated, generally early in the morning. They were given an empty orange box with an open top. It was made of slats of light wood with one narrow side taken out halfway. It was fixed to the roof of the bird house, sheltered above by a sheet of perspex and covered with conifer branches. The trees close to the aviary protected it from the heat and a honeysuckle climbing on an aviary panel nearby provided the birds with leaves which they often tore, but, unlike our grey touracos did not eat. The aviary was planted with grass and conifers, and provided with rocks and paving and a small pool in which they bathed frequently. The aviary's size was approximately 8' by 10' by 20' which I do not consider to be really large enough. In the nestbox I prepared a layer of fresh hay and the birds added a few small sticks only.

On Saturday 30th April 1988, both touracos spent the night

together in their nestbox for the first time. Previously the male had slept there alone whilst the hen roosted in their shelter. I hoped they might have one or two eggs since most touracos lay two eggs in a clutch, but I was not prepared to disturb them, and, since the male or the hen was constantly incubating, I waited impatiently without interfering. The incubation period for touracos varies with the species. For Purple-crested Touracos I found it to be between 22 and 24 days. The eggs are white, round and smooth, similar in size to those of a domestic dove. Apparently, the parents eat the eggshell after the eggs hatch. They are also supposed to eat the faeces but I never saw them do this. However, the nest was always kept clean.

It was as late as 31st May when both parents left the nest to feed and I saw a small dark grey chick, covered in soft down with its eyes open, and its dark grey bill gaping defensively. An egg was next to it. I took the egg away and put it under my hen White-cheeked Touraco which was used to the role of foster-mother. Sadly, the egg was infertile. I decided not to attempt to hand rear the chick and not to handle it in case I upset the parents. The parents fed the chick regularly by regurgitation. It grew larger and looked healthy. It moved easily and I was very relieved to see it standing up on its little black legs, hissing and trying to bite me, full of hostility and dislike. Baby touracos often have problems with their legs which may stick out at odd angles and, unless treated with a splint, will cripple the bird. I did not remove the chick to examine it before it was two weeks old and so I never saw the tiny claws attached to its wings. The little black claws, present on the other chicks which I hand reared from the egg, disappear around the fifth day and are a reminder of their pterodactyl ancestry. I noticed that its black eyes had a blue centre, and as the days went by, the pink parting on its head disappeared under new dark blue feathers. Its beak, slightly pink, became totally black and the soft sooty down hardened into black quills. They developed into lovely blue feathers on the wings and tail.

The chick was fed on my usual touraco mixture of fruit (apple, pear, banana, orange, carrot, grape, paw-paw) with pieces of hard boiled egg and brown bread soaked in honeyed water mixed with Milupa. I sprinkled it with Vionate and boneflour. Each week, I gave the chick a syringe full of water with Cytacou, some Vionate and Complian. Although offered mealworms, its parents never picked them up. As the weather became warmer, the parents left the chick alone more and more and I could watch it preening itself

assiduously. At two and a half weeks, the chick no longer showed any quills. It would peck at sticks, its beak was totally black, and it could make a small noise. No red skin had yet grown around the eyes. On 29th June the young Purple-crested left the nest and was able to fly a little. On the next day, it went into the bird house but still spent most of the time in the nest. There was no sign of aggression towards it by the parents, or any fighting. Although the neck showed some green and a little purple crest appeared, no red feathers grew on the wings which were still midnight blue. I never saw it feed and it seemed to enjoy flying or hopping around the aviary intent on new discoveries but returning to the safety of the nest at dusk.

On 11th July I found two eggs in the nest which were incubated by all three birds. Sadly, they were infertile, and I have not bred another Purple-crested touraco since my hen died in 1989. At the end of July, I put the chick in a large cage and took it into the house. It fed itself without hesitation which was a great relief. Red feathers appeared and the bird became very colourful. The dominant colour was the green of its father and thus it looks like the race *M. l. chlorochlamys*.

Other young touracos which I had bred that summer were also in the birdroom. They hated the Purple-crested youngster which would show off and try to crow. I was certain that it was a cock which was confirmed by surgical sexing by Andrew Greenwood. I think that this was a first breeding in captivity in England. I know now of a few more collectors who have subsequently been equally successful in breeding the Purple-crested Touraco.

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This is probably the first successful breeding of a Purple-crested Touraco in this country. Anyone who knows of a previous breeding in the U.K. is asked to inform the Hon. Secretary.

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## A NEW SUB-SPECIES OF THE SPICE BIRD *LONGHURA PUNCTULATA* FROM BORNEO.

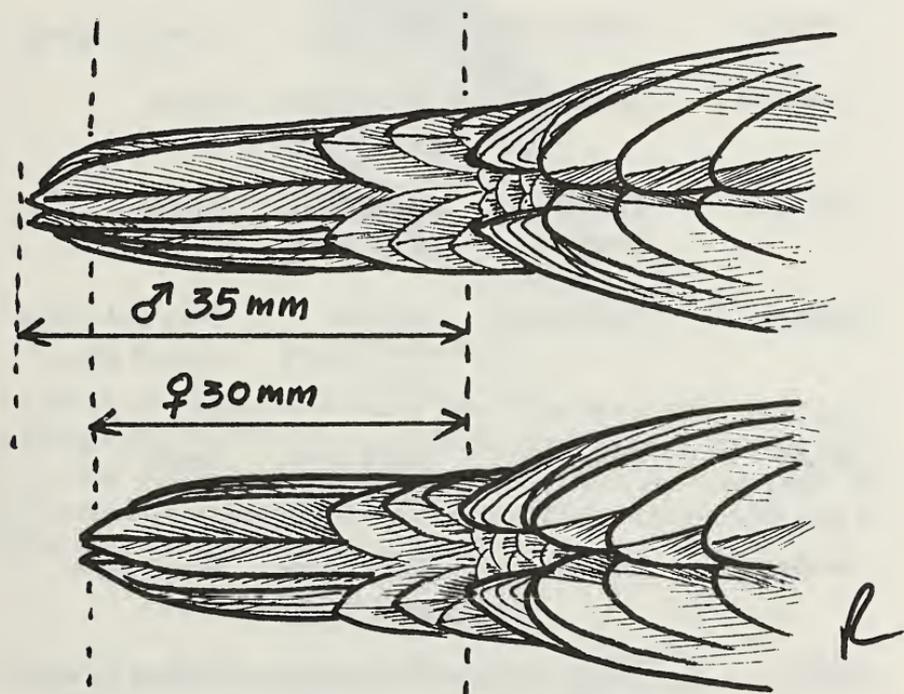
By Robin L. Restall (Hong Kong)

A friend in England wrote to me recently saying that he had been to a dealer to see some munias and had noticed some "extremely clearly marked and beautiful Spice Birds", and immediately bought a pair. He wondered if I could identify them. The Spice Bird, *Lonchura punctulata* like a couple of other congeners, the Striated Munia *L. striata* and the Black-headed Munia *L. atricapilla*, has a most extensive range. The only source of reference to aid in the identification of the various sub-species for all three is Goodwin's "Estrildid Finches of the World" (1982). In the case of the Spice Bird, Goodwin is inadequate as my friend discovered. This is not because his birds were not described, for they turned out to be the Indian race *L. p. punctulata* which is described in exquisite detail, but because not all the races are described and there is no means of making comparisons between the races.

In my book "Munias and Mannikins of the world" I have described every race of every species of *Lonchura*, and illustrated every one in colour. In the preparation of this I was able to study museum skins in many countries, study birds in the field, and in many cases keep live birds for individual study. In the case of the Spice Bird I learned of a virtually unknown race, *L. p. baweana* (described by Hoogerwerf in 1963) from the island of Bawean, and I discovered that the Spice Bird occurs in Kalimantan, Borneo (recorded by Harvey and Holmes in 1976, and by Holmes and Burton in 1987). Subsequently I was able to obtain nine of the Borneo Spice Birds from the country east of Pontianak and shipped direct from that city, and also study a batch of twenty shipped to Jakarta from Banjarmasin.

The Borneo Spice Bird differs from other forms sufficiently to justify sub-specific recognition and I have referred to it as *L. p. holmesii* after Derek Holmes who first described it. It is about 110 mm long, males being 5 mm or more longer than females. It is dark cinnamon above with the edges of the wing coverts broadly fringed with light cinnamon-brown. From the nape to the lower back and the wings, but not the paler edgings, it is finely barred with darker wavy lines reminiscent of that on some waxbills, genus *Estrild*, and this is constant in all plumages from 1st year adult onwards.

The lower back is olive-brown graduating to brownish olive-grey on the uppertail-coverts and tail, which are barred and edged with a very pale straw. The visual effect is of a very pale grey tail. The face is dark reddish-umber, becoming hazel on the outer ear-coverts and sides of the neck where there are a few pinky-white dots. The breast and sides of breast and flanks are white with the characteristic scale markings in dark umber, appearing black on the lower flanks. The underwing-coverts are pale cinnamon with some darker edges, and maybe dark centres. The centre of the belly is pale cream. This graduates to very pale straw on the undertail-coverts. The bill is bluish-grey, tending to blackish on the upper mandible but not black. The irides are dark ruby. The legs and feet are dark grey. The females I measured were about 105 mm and all had shorter tails. Measuring from wingtip to tail tip, the females measured 30 mm, while the males measured 35 mm.



Robin L. Restall

*Comparison of tail length of Bornean Spice Birds.*

It might be helpful here to do a comparative list of the sub-species of *L. punctulata*.

<u>Race</u>	<u>Origin</u>	<u>Bill Colour</u>	<u>Uppertail-coverts</u>
<i>punctulata</i>	India	Black	Orange
<i>subundulata</i>	East India Bangladesh North Burma	Black	Yellow or Olivaceous
<i>topela</i>	Burman to China Thailand to Vietnam	Black	Yellow straw (inc. rump)
<i>fretensis</i>	Pennisula Thailand Malaysia Sumatra	Black	Straw edgings
<i>cabanisi</i>	Philippines	Blue-grey	Cream edgings
<i>baweana</i>	Bawean Island	Black above grey below	Straw
<i>nisoria</i>	Java, Bali, Lombok	Black above grey below	Straw
<i>holmesii</i>	Kalimantan	Blackish above, grey below	Very pale straw to pale grey
<i>fortior</i>	Sumbawa	Black above grey below	Straw
<i>sumbae</i>	Sumba	Black above grey below	Warm olive
<i>blasii</i>	Flores to Timor and Tanimbar	Black above grey below	Yellow straw
<i>particeps</i>	Sulawesi (Celebes)	Black above grey below	Olivaceous- yellow

The race naturalised in Australia is *topela* (Lever, 1987). There

is an excellent photograph of this bird in the "Readers Digest Book of Australian Birds" (1976), which I take to be a young bird in its first adult plumage as the yellow on the rump is non-existent and the uppertail-coverts are very poorly marked. There is another superb photograph of a Spice Bird in "Birds International" (Briffet and Strange, 1990) which ought to be of the race *fretensis* since the article is about birds in Singapore but the lower mandible is clear pale blue-grey, so maybe it is one of the escapes from one of the many bird dealers on the island, who regularly import the common seedeaters from Jakarta.



Robin L. Restall

Borneo Spice Bird

I have one pair of the Borneo Spice Bird in my collection here in Hong Kong, in a roomy box-type breeding cage on our balcony. As I write (early January, '92) they are at last showing signs of breeding activity but our weather is dreadfully changeable and it really does put the birds off at times.

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## ANY HOPE FOR HORNBILLS?

By Roger Wilkinson  
(Chester Zoo)

A recent report in "News and Views" of the *Avicultural Magazine* (1992, Vol. 98, pp 38 - 39) of the ICBP/IUCN/CBSG workshop on Asian Hornbills in Singapore suggested, that: "Conservation through aviculture seems hopeless since there are few pairs in zoos or private collections and, in any case, zoos cannot or are not willing to devote sufficient space for them to breed". This is only partly true. For many of the rarer Asiatic species then it is true that there are presently few pairs in captivity. On the other hand many Hornbills are proving to be amenable to captive management and increasingly more private collections and zoos are achieving breeding results with a number of species.

The smaller Hornbills of the genus *Tockus* are perhaps most suited to private collections and smaller zoos with limited facilities. Considerable expertise is now being amassed on their husbandry and reproductive requirements. Registers of birds bred in the U.K., produced by the Foreign Bird Federation, list no Hornbills bred from 1985 to 1987 but then twelve birds of three species (the African Grey Hornbill *Tockus nasutus*, the Yellow-billed Hornbill *Tockus flavirostris* and the Red-billed Hornbill *Tockus erythrorhynchus*) were reported as bred in 1988 and sixteen birds of four species were bred in 1989 (again including the Red-billed and Yellow-billed Hornbills but also the Abyssinian Ground Hornbill *Bucorvus abyssinicus* and the Trumpeter Hornbill *Bycanistes bucinator*). In 1990 a total of eighteen Hornbills of four species were recorded as bred including second successes with the Abyssinian Ground Hornbill and Trumpeter Hornbills and a third *Tockus* species, the Von der Decken's Hornbill *Tockus deckeni*. A recent article in *Cage and Aviary Birds* noted that in 1991 one private breeder, Steve Horne of Northamptonshire, reared fifteen Red-billed Hornbills, most significantly including four from a hen that he had bred four years earlier. In 1991 other Hornbills that I know were bred in the U.K. included again Trumpeter Hornbills and African Grey Hornbills. Such consistency in breeding suggests that in fact there is a very good future for at least the smaller species in aviculture. Another recent success was that of Exmoor Bird Gardens with Tarric Hornbills *Penelopides panini*, bred in 1991.

A report by Bruce Bohmke, Curator of Birds at St. Louis Zoo, on trends in the North American population of captive Hornbills (ICBP Hornbill Group Newsletter, no 1.), indicates that twenty three species of Hornbills are held in collections in the USA (presently most/all zoos as these are from ISIS statistics) of which twelve species bred in fourteen different locations. However, again it is the *Tockus* Hornbills which are proving to be the most successful with four out of the five species kept in the USA producing five or more offspring in 1990. Also encouraging is his remark that both species of Ground Hornbills are well on the way to being established. However only two zoos are breeding Southern Ground Hornbills *Bucorvus leadbeateri* and within a few years the majority of the American population will be related to the breeding pair at Jacksonville Zoo (Koen Brouwer - personal communication).

The *International Zoo Yearbooks* list recorded breedings at the world's major zoos and I have tabulated the numbers of Hornbills bred since 1980. Clearly the world's zoos have been breeding a number of Hornbills annually and for five species these have been bred to at least the second generation. However for some species breedings have been restricted to only one or two zoos and often refer to repeated breedings of the same pair or pairs of birds. Because of this Peter Olney, then Curator of Birds at London Zoo, initiated in 1985 an annual survey of Hornbills in UK zoos and their cooperative management was overseen by him for the Joint Management of Species Group. London Zoo then had a good collection of Hornbills and had led the way in breeding the Tarric Hornbill *Penelopides panini* and the Jackson's Hornbill *Tockus jacksoni*.

In 1990 a European Hornbill survey was initiated by Koen Brouwer of the National Foundation for Research in Zoological Gardens / EEP Executive Office in Amsterdam and this was updated in 1991. The update lists some 700 Hornbills of 29 species and 18 sub-species kept in over one hundred European zoos and private collections. The most commonly kept Hornbill is the Great Indian Hornbill *Buceros bicornis* with 126 birds in 61 collections, this is followed by the Red-billed Hornbill with 92 birds in 40 collections then perhaps surprisingly by the Wrinkled Hornbill *Aceros corrugatus* with 68 birds in 24 collections.

Although as aviculturists we may be quite proud of our achievements with Red-billed Hornbills we clearly have a long way to go with the larger species. As such a Regional Studbook has been initiated for the great Indian Hornbill in the United States and this

## WILKINSON - HORNBILLS

Numbers of Hornbills successfully reared. \* indicates multiple generation captive breedings. (H) = hatched but not reared.

	80	81	82	83	84	85	86	87	88	89
African Grey Hornbill <i>Tockus nasutus</i>			5	5	8	8	6	11*	12*	15*
Red-billed Hornbill <i>Tockus erythrorhynchus</i>	27*	34*	40	39*	25*	31*	31*	23*	21*	35*
Northern Red-billed Hornbill <i>Tockus e. erythrorhynchus</i>							4*			
Yellow-billed Hornbill <i>Tockus flavirostris</i>				4	2		1	6	4	1
Southern Yellow-billed Hornbill <i>Tockus f. leucomelas</i>	1	9	13				1	2		
Von der Decken's Hornbill <i>Tockus deckeni</i>						1				
Jackson's Hornbill <i>Penelopides panini</i>		4	2		4	3	11*	7*	7*	8*
Tarictic Hornbill <i>Penelopides panini</i>			3	3	(H)		2	1	(H)	
Luzon Tarictic Hornbill <i>Penelopides p. manilloe</i>		2					1	2	3	1
Wrinkled Hornbill <i>Aceros corrugatus</i>									1	2
Malayan Wreath-billed Hornbill <i>Aceros undulatus undulatus</i>	3	2	1	1	1			1	1	
Indian Pied Hornbill <i>Anthracoeros malabaricus</i>		2	4	3	2*	3	5	3*	2*	2*
Trumpeter Hornbill <i>Bycanistes bucinator</i>									2*	2*
Black and White Casqued Hornbill <i>Bycanistes subcylindricus</i>	4	3	2	1	1	1	2	1	1	
Grey-cheeked Hornbill <i>Bycanistes s. subquadratus</i>				2			1			
Rhinoceros Hornbill <i>Buceros rhinoceros</i>						(H)	2	1	1	1
Great Indian Hornbill <i>Buceros hydrocorax</i>	1	(H)	1	2		(H)	1	3	2	3
Rufous Hornbill <i>Buceros hydrocorax</i>		(H)						(H)		
Abyssinian Ground Hornbill <i>Bucorvus abyssinicus</i>	3	5	4	1	1	5	11*	3*	16*	10*
Southern Ground Hornbill <i>Bucorvus leadbeateri</i>	(H)	1	2	3	1				2	

species now has an International studbook run by Wendy Worth, Curator of Birds at San Antonio Zoo. A European breeding programme (EEP) for Great Indian Hornbills is being managed by Koen Brouwer who requests that holders of this species in Europe interested in joining the breeding programme contact him at the National Foundation for Research in Zoological Gardens/EEP Executive Office, c/o Amsterdam Zoo, P.O. Box 20164, 1000 HD, Amsterdam, The Netherlands. He would also be pleased to be contacted by people working with other Hornbill species.

Hornbills are becoming increasingly rare in the wild and seven species, all Asian, are included in the 1990 *IUCN Red Data Book*. These are the Rufous-necked Hornbill *Aceros nipalensis*, the Wrinkled Hornbill *Aceros corrugatus*, the Sumba Hornbill *Aceros evereti*, the Plain-pouched Hornbill *Aceros subruficollis*, the Narcondam Hornbill *Aceros narcondami*, the Sulu Hornbill *Anthracoceros montani* and the fabulous Helmeted Hornbill *Rhinoplax vigil*. Of these threatened species only the Wrinkled Hornbill is represented in European collections but has not to date been successfully bred in Europe. More encouragingly in the United States a Wrinkled Hornbill was reared at New Orleans Zoo in 1988 and two more in 1989. Miami Metro Zoo also hatched chicks but these were not successfully reared. A pair at Chester Zoo mudded in in 1990 but the female emerged from the nest without any indication of eggs or chicks. In 1991 the same pair nested again but that time two dead naked chicks were thrown out of the nest. In Belgium a private breeder reported that his female Wrinkled Hornbill mudded in and produced two eggs in 1990 but these also were thrown out of the nest. Clearly this is one species that needs our concerted effort and now is the time to act.

#### ACKNOWLEDGEMENT

I am grateful to Koen Brouwer for his constructive comments on this manuscript.

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## BLUE-CROWNED HANGING PARROTS BREED SUCCESSFULLY AS A TRIO

By Fred Barnicoat  
(Johannesburg, South Africa)

A recent breeding success with the beautiful little Blue-crowned Hanging Parrot *Loriculus galgulus*, which I think may be of general interest, has just occurred in the aviaries of Mrs. Gwen Smith. She purchased her first pair some 3 ½ years ago. For a considerable time they made no attempt to breed, but were such delightful inmates in the large, planted aviary that a second pair was added to the mixed collection of birds a little over a year later. One of the males subsequently died and it proved impossible to replace him.

Quite suddenly in November 1991 a pair of the birds was noticed to be going in and out of one of the nest boxes that had been hung up in the aviary. At first Mrs. Smith did not dare to look inside the box, into which she had put a couple of inches of a mixture of peat moss and wood shavings, dampened and rammed down hard. The first indication that there were youngsters in the nest was when they could be heard squeaking while being fed. Both the mother and father went in and out of the box to feed the babies. Eventually when both birds happened to be out of the box it was taken down and found to contain four fully feathered babies. Considerable disappointment was in store, however, because as they left the nest all but one of the babies were lost. One died by getting its claw hooked in the wire netting of the aviary and being so trapped over night, and two others were probably not fed sufficiently by the parents. Perhaps as sometimes happens with birds the parents concentrated their efforts on the strongest one. This one, however, was fully reared and is a fine specimen.

A further surprise development was that in mid December both hens were discovered to be incubating eggs simultaneously in separate nest-boxes. The only surviving male must have serviced both females, and the one reared two, the other three fine youngsters without any mishap. When the babies first leave the nest they are very clumsy with their feet and are extremely comical to watch. As their green colour blends with the different shades of green of the various shrubs growing in the aviary, they are difficult to spot, the more so when they are hanging upside down on a branch, as is frequently the case.

About 1988 quite a large number of this attractive species was brought into South Africa and sold by the leading dealers. Very few breeding successes with them have been reported. Apart from her large and attractively planted aviary, the reason for this breeding success may be connected with the feeding methods. Mrs. Smith is the first person I have heard of to use commercially sold fruit juice, which is advertised as having no sugar added, as the daily supply of nectar. She uses the peach/apricot mixture and dilutes it with a little water. In a separate container she also supplies a very sloppy mixture of an infants' bran porridge with honey flavouring, a little honey and the fruit juice. In addition at least three fruits are fed fresh daily. The Hanging Parrots love grapes, apples, paw-paw, figs, pears, water melon, mango and corn (maize) cut from the cob. Sweet corn is available all the year round in our shops nowadays as stocks can be frozen. The Hanging Parrots seem to prefer the corn to any other fruit and pick out the pieces cut from the cob first of all from the mixture of fresh fruits. The nectar and the porridge mixture are fed twice daily.

I have found that my own pair of Blue-crowned Hanging Parrots prefer prickly pear to any other fruit. I feed this fruit halved and they scoop out all the fleshy part and every seed through the day, leaving only the skin. My pair, purchased in the same year, has never attempted to breed. Perhaps they are not compatible, and I rather fancy that the hen was an old bird, but I have wondered if it is a disadvantage to have a single pair and if they are stimulated into breeding activity by being in a community.

## INCUBATION OF CRANE EGGS BY COCHIN HENS

By Thomas A. Mahan

(International Crane Foundation, Baraboo, U.S.A.)

There are several ways to incubate bird eggs. Recent advances in technology have enabled the aviculturist to use artificial incubators efficiently (Stromberg, 1975; Putnam, 1981; Burnham, 1983). Eggs can also be naturally incubated using the parents, similar birds, or broody hens (Stromberg, 1975; Putnam, 1981; Lauver and Kunneman, 1985.) Natural incubation is, by far, much better than artificial incubation (Putnam, 1981; Burnham, 1983; Heck and Konkel, 1983) at achieving hatching success. Many aviculturists, however, are unable to utilize either artificial incubation or natural incubation using similar species. A lack of equipment or a reliable power source can greatly hinder an artificial incubation programme. Also, some facilities may not be able to use similar species if large amounts of space or resources are required for their housing.

Broody hens have been used quite successfully as surrogate incubators for a variety of bird species (Heck and Konkel, 1983; Lauver and Kunneman, 1985) but some aviculturists have had poor results (C. Kuehler, pers. comm.). The main objects of this study were to 1) compare the success of incubation of crane eggs by broody hens with artificial incubation and incubation by cranes; 2) determine if crane eggs incubated by hens need to be hand-turned; and 3) develop a husbandry protocol for using hens to incubate crane eggs.

I would like to thank C. Mirande and S. Swengel for their helpful comments, S. Swengel for his statistical assistance, K. Rassmussen for her compilation of incubation records at the International Crane Foundation and the aviculture staff at the International Crane Foundation for their help in maintaining the chickens and for turning the crane eggs.

### Methods

A flock of standard Cochin chickens was used for this experiment. It was divided into four groups, each group consisting of one rooster and five hens. The chickens were housed in a building divided into four rooms each 10' x 10' x 8'. Heat was supplied in the winters. Windows located on opposite walls provided adequate ventilation. Access to a 10' x 20' outside run was available. The rooms had concrete flooring covered by wood shavings for bed-

ding. Bedding was changed every 3 - 4 weeks as needed. The birds were fed on a commercial poultry diet *ad lib*. Fresh water was given daily.

Two types of nest boxes were provided for the incubating hens. An open front box was set on the floor for hens to begin their own clutches. Once a hen became broody she was moved to a nest box with a door. The hen remained in this "lock box" throughout the incubation period except during daily breaks. Lock boxes were secured to a wall at a height that facilitated easy removal of the hen by the aviculturist. In 1989 the lock boxes used measured 12" x 12" x 12" and were lined with wood shavings. In 1990 they were enlarged to 14" x 14" x 14" and were lined with shredded tobacco. The tobacco controlled insect pests and created a sturdier nest than did the shavings.

We were able to synchronize the hens' broodiness with the production of crane eggs by manipulation of the hens' photoperiod. Each of the four rooms have a separate photoperiod system. The hens' daylength was extended from 8 hours to 14 hours 30 days before laying of the first crane eggs was anticipated. In order to extend the flock's sitting time the onset of 14 hour days was staggered so that as one group went off being broody, another became broody. Each hen incubated for 30 days.

Thirty six fertile crane eggs were used for this study. They included eggs from the following species: Red-crowned *Grus japonensis*, White-naped *G. vipio*, and Florida Sandhill *G. canadensis pratensis*.

The following procedure guided the handling of the crane eggs:

- 1 Newly laid crane eggs were fumigated using a mixture of potassium permanganate solution and formaldehyde. Eggs were then placed under a hen that had become broody within the previous 2 - 3 days. Each hen incubated two eggs.

- 2 The crane eggs were incubated full term (29 - 31 days) and were removed two days before hatching. Half of the eggs were hand-turned and every egg was weighed twice a week. Fertility was determined by candling after about ten days incubation and infertile eggs were removed.

- 3 Two days before hatching each egg was removed from the hen and transferred to an artificial hatcher where hatching was monitored and recorded.

- 4 Chicks or unhatched embryos were medically examined following hatching or incubation.

There was some doubt whether the hens could turn the crane

eggs sufficiently to allow the chicks to develop normally. To test this, half of the fertile eggs were turned by hand five times per day throughout incubation. The remainder of the eggs were left unturned.

The study was divided over two breeding seasons, 1989 and 1990. In 1989 fourteen fertile eggs were incubated by chickens. Of those fourteen, seven were hand turned and seven left unturned by aviculturists. In 1990 twenty-two fertile eggs were incubated by chickens. Eleven were hand turned, and eleven were left unturned by aviculturists. We compared the success of artificial incubation with that of natural incubation, a combination of both artificial and natural incubation and chicken incubation (see Putnam, 1981). Standard statistical methods were used to compare the results of the two methods.

### *Results*

In 1989 four of the seven hand-turned eggs hatched producing chicks with the following characteristics:

- one had no problems and had a normal development,
- one had an open umbilicus,
- one had crooked toes and could not easily stand up
- and one had a splayed leg.

Three of the seven hand-turned eggs did not hatch. Their embryos had the following characteristics:

- one had an open umbilicus,
- two were malpositioned,
- two had unretracted yolk sacs,
- two were oedematous in the head and shoulder area
- and two reached the peeping stage of hatching but only one of them pipped and rotated.

Of the seven that were not hand turned in 1989, three of them had normal hatches but one had a large blister around the vent and the other's umbilicus was still open. Four eggs that were not turned did not hatch and the embryos had the following problems:

- two were malpositioned,
- one had an unabsorbed yolk, crossed legs, and an oedematous hatching muscle,
- one pipped, but died later with its yolk unabsorbed
- one died after 5 - 10 days of embryonic development

In 1990 only one of the eleven hand-turned eggs hatched, but the chick did not have a fully absorbed yolk sac. The ten that did not hatch had the following characteristics:

- eight were severely malpositioned and five of these had twisted necks,

one had abrasions and blisters on its hocks,  
five had cranial oedema,  
two were underdeveloped,  
four had partially absorbed or unabsorbed yolk sacs  
and three had been moving or scratching but failed to hatch.  
In 1990 5 of 11 unturned eggs hatched. Three hatched normally but one had a splayed leg and another had an open umbilicus. Six of the eleven unturned eggs did not hatch and had the following problems:

two died one half to three quarters way through incubation,  
four were malpositioned,  
four had unabsorbed yolk sacs,  
one had curled toes,  
three had twisted necks and cranial oedema,  
four had blistered or oedematous hocks and carpals,  
and one had a severely twisted right leg.

A combination of natural and artificial incubation (7 - 10 days natural incubation, 20 - 23 days artificial incubation) resulted in a hatching rate of 82% (n = 21). Eggs that were naturally incubated had the second highest rate of hatching (80%, n = 30). Eggs which were artificially incubated in electric incubators hatched at a rate of 59% (n = 153). The results of the chicken incubation show a 36% hatching rate (n = 36).

### *Discussion*

The data from 1989 and 1990 combined indicate that hand-turning crane eggs during chicken incubation does not improve hatchability. In 1990 there was a higher hatchability in those which were unturned than in those which were turned.

The type of problems exhibited by both hatched and unhatched chicks indicate that turning of each egg during incubation is not adequate. The most notable features were malpositions and twisted necks. There were also many indications that the chicks struggled considerably while trying to hatch. These included cranial oedema, and oedematous and blistered hocks and carpals.

After the 1989 season it was thought that a major cause of the low hatchability was inadequate space inside the lock box. We thought that the hens might need a larger than normal space in which to move because crane eggs are much larger than chicken eggs. To turn the eggs a hen must lift up her body. If it is not possible for the eggs to be rotated adequately normal development cannot take place (Landauer, 1967; Stromberg, 1975). We therefore enlarged the nest boxes by six cubic inches. Tobacco was used

again in the second year because the wood shavings used in 1989 did not maintain the nest shape when the hen turned the eggs. The hen merely pushed the eggs through the shavings without turning them. The tobacco proved to be a much more supportive nesting material. Many aviculturists who use chickens as incubators recommend sugar cane for nesting material but we were unable to obtain sugar cane for this study.

Our analysis showed that chicken incubation is the least successful form of incubation for crane eggs. A combination of natural incubation and artificial incubation had the highest hatch rate. To use broody hens for incubating crane eggs one must be prepared to expend more effort than would be used for the other forms of incubation. Chicken incubation could be the final option if natural incubating cranes are not available or if artificial incubators or a dependable power source are difficult to obtain. We recommend that, if possible, a breeding facility should be located where artificial incubation or crane incubation is accessible.

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## THE STATUS OF AUSTRALIAN FINCHES IN THE UNITED KINGDOM

By A. J. Mobbs  
(Walsall)

Until 1960, when the Australian Government placed a ban on the export of its fauna, substantial numbers of Australian Finches had been exported annually to the UK. Certain species had been bred over the years before the ban came into effect, but no serious attempt (other than with the Zebra Finch) had been made to develop captive-bred strains. Indeed, it was not until 1971, when the Australian Finch Society was formed, that serious attempts at breeding Australian Finches came into being. At first many scarce species proved difficult to establish, mainly due to the lack of healthy stock. However, as more aviculturists became interested in Australian Finches, the number of captive-bred birds increased. The fostering of eggs and/or chicks (mainly under Bengalese Finches) was carried out extensively and, in certain cases, still is to this day. Indeed, without the aid of Bengalese and the occasional import of birds from the Continent, it is doubtful whether certain Australian Finch species would be available nowadays to UK enthusiasts.

Partly because of the inclement weather conditions experienced in the UK, most Australian Finch enthusiasts house their birds in cages in heated birdrooms. Even so, substantial numbers are bred each year in outside aviaries. However, few keep their birds permanently in such accommodation, and those who do, ensure that their birds have a heated shelter to which they can retire during the colder months of the year. As with most species which are bred under captive conditions over many generations, mutations have appeared in several Australian Finches. Indeed, at the time of writing, new colour mutations are appearing (in the Gouldian Finch especially) with almost monotonous regularity. However, so far, only the Lilac-breasted Gouldian Finch appeared first in the UK, with the White-breasted mutation first appearing in South Africa. The remainder of the mutations (in all species) first appeared on the Continent, with almost identical mutations appearing in Australia.

There follows a resume of the status of Australian Finches (excluding the Zebra Finch) in the UK today.

**Red-eared Firetail** *Emblema oculata*.

The species is unavailable to aviculturists outside Australia.

**Beautiful Firetail** *Emblema bella*.

No longer known to aviculture outside Australia, this species can only be kept in captivity in its country of origin if a permit is obtained. It appears that the species is difficult to keep alive, let alone breed. Because of this, it is doubtful if it will ever become established in aviculture, even in Australia.

**Diamond Firetail** *Emblema guttata*.

This, one of the largest of the Australian Finches, is bred in fairly substantial numbers every year. Sexing can be difficult, especially for the person with little or no experience with the species. Three mutations are available and all are well-established in the UK. The Fawn is the mutation most widely bred. The Yellow, which has the red of the rump replaced by yellow (and also has a less intense red beak than that of the Normal) is also well established. The Yellow/Fawn, although not bred in such numbers as the other two mutations is, nevertheless, well established in the UK.

**Painted Firetail** *Emblema picta*.

Until three or four years ago, the number of Painted Firetails in the UK was very low and, without the occasional consignment from the Continent, the species would have become virtually non-existent. However, over the past few years, more enthusiasts have taken up the breeding of this delightful species and at present a reasonable number are being bred every year. If the current interest remains, there is no reason why the Painted should not eventually become self-sustaining in the UK, without our having to rely on imports from the Continent. There are no mutations available in the UK (or on the Continent). However, in Australia a Pink mutation has occurred.

**Crimson Finch** *Neochmia phaeton*.

There are two sub-species of the Crimson Finch, namely the Pale or White-bellied (*N. p. evangelinae* and the Black-bellied *N. p. phaeton*). Both forms are rare in the UK and without the occasional influx from the Continent, it is doubtful if either race would be available to UK enthusiasts. Hens (of both races) appear to be delicate. This, coupled with the fact that cock birds often show extreme aggression towards their mates, in certain cases actually causing their death, is one of the reasons why so few are bred each year. Spare cock birds are sometimes offered for sale in the UK but

it is rare to see pairs offered.

**Star Finch** *Neochmia ruficauda*.

One of the most popular Australian Finch species, the Star Finch is bred in fairly substantial numbers every year. Two races are recognised. However, other than in their country of origin, they have become so interbred, that it is impossible to identify the races in captive birds. In the UK, two mutations are available, namely the Yellow and the Pied. Both are fully established.

**Red-browed Finch** *Aegintha temporalis*.

Often given the misnomer 'Sydney Waxbill', this species is not popular with enthusiasts in the UK. This is due partly to its resemblance to an African Waxbill. Also the high price asked for any which come on the market can prove a further deterrent to potential breeders. Certain UK breeders have experienced success with the species but, as they have usually found difficulty in disposing of surplus young, few have continued to breed the Red-browed for more than a season or so.

**Blue-faced Parrotfinch** *Erythrura trichoa*.

Large numbers of this species are bred in the UK every year. At present there is only one mutation, namely the Lutino. Being sex-linked, substantial numbers were bred in a very short period and the mutation is readily available.

**Gouldian Finch** *Chloebia gouldiae*.

Without doubt, the Gouldian is the most popular of the Australian Finches, not only in the UK, but also in the remainder of the avicultural world. It also appears that the species is becoming increasingly scarce in the wild, mainly because of problems with air-sac mite. Indeed so scarce is the wild Gouldian, that there is every possibility that it will shortly be placed on the endangered list. As a result of the large numbers bred in captivity each year throughout the avicultural world, it is little wonder that of all the Australian Finch species, the Gouldian has produced the largest number of mutations. As well as the two head colour varieties, where red is replaced with either black or orange (these are found in the wild and are usually referred to as Normals), there is also the White-breasted (in all head colours) and the Lilac-breasted (again in all head colours), plus the more recent mutations such as the Dilute, Blue-backed, Yellow-backed, Silver, Pastel, Dilute-backed, Lutino, Australian Yellow, European Yellow (all of which can be found in White-breasted as well as Normal breast colour), plus the Blue-breasted. Recently a White mutation has occurred. This list

is by no means exhaustive as new colour mutations are appearing with such regularity that, it is difficult to keep up with them.

**Masked Grassfinch *Poephila personata*.**

The Masked is not as popular as the Long-tail (and Heck's), because of the difficulties experienced when attempting to sex this species. The species appears to be more difficult to breed than the aforementioned. Numbers are not so low as to endanger its existence in the UK. However, a concerted effort on the part of Australian Finch enthusiasts to breed more Masked would help to ensure its availability to future enthusiasts. There are no mutations available in the UK. Neither is the sub-species known as the White-eared Grassfinch.

**Long-tailed Grassfinch *Poephila acuticauda acuticauda*.**

The long-tail differs from the Heck's (see later) in that its beak is yellow rather than sealing-wax red. In the past breeders preferred the bright red beak of the Heck's, considering it to be more attractive than the yellow beak of the nominate race. This coupled with the fact that the red beak of the Heck's is dominant to the yellow of the Long-tail, meant that pure Long-tails became scarce. Indeed they would have disappeared, if it were not for several dedicated enthusiasts who, determined not to let the Long-tail vanish from our collections, searched out those available and began to breed from them. Without their efforts few, if any Long-tails would be available in the UK to-day. Over the past few years, numbers have gradually increased and as more breeders became aware of the plight of the Long-tail, more took up the breeding of these yellow-beaked birds. In all probability, the pure Long-tail is now secure in the UK. Although I have not actually seen examples, mutation Long-tails are offered for sale from time to time. Usually it is Fawns and Whites that are offered.

**Heck's Grassfinch *Poephila a. hecki*.**

Although the Heck's is a sub-species of the Long-tail, such large numbers are bred in the UK each year I consider that the race is entitled to an entry of its own. It is an extremely robust bird and is an ideal subject for the newcomer to Australian Finches. However, because of the numbers bred, many breeders find difficulty disposing of the surplus young. At present there are four mutations of the Heck's Grassfinch, namely Fawn, White, Pied and Cream. The latter is considered by many to be an aberration of the White, rather than a true mutation. It appears that 'cream' birds are usually obtained when White is mated to White. The Fawn is bred in substantial numbers every year and is as readily available as the

Normal. Pied are extremely scarce (if they still exist) and it is several years since I have seen a specimen.

**Black-throated Finch** *Poephila cincta*.

As with the Heck's Grassfinch (which it resembles except for its black beak and lack of tail-wires), the Black-throated is bred in substantial numbers every year. Currently there are four mutations available, namely Fawn, White, Cream and Pied. The Fawn is as common as the Normal. Whites are also fairly numerous. The Cream is, as with the same mutation in the Heck's (see above), considered by many not to be a true mutation. Pieds are extremely scarce and there is every possibility that none is available in the UK at present. Many mutation Black-throated have reddish coloured beaks and it is obvious that these have Heck's blood in their make-up. Certain individuals also have rudimentary tail-wires which is a further indication that the Heck's Grassfinch has been used to produce the mutations currently available in the Black-throated.

**Bicheno Finch** *Poephila bichenovii*.

Undoubtedly because of the difficulties experienced when attempting to determine the sex of individuals, numbers remained rather low for many years. However, most breeders now use my method of sexing; i.e. caging each (adult) bird individually for five or ten minutes because separation from others of their kind will usually persuade cock birds to sing continuously. Being able to determine the sex of individuals has meant that, over the past few years, substantial numbers have been bred. It is also noticeable that breeders selling surplus stock now offer birds of guaranteed sex. There are two sub-species of the Bicheno Finch, namely *P. b. bichenovii* which has a white rump and *P. b. annulosa* in which the rump is black. Until a few years ago, the latter race was in danger of being lost to aviculture in the UK. However, the black-rumped race, over the past seven years or so, has been bred in ever increasing numbers and, as the colour inheritance in both races is now well documented, it is hoped that the black-rumped race will never again become so low in numbers as to endanger its existence in the UK.

**Plum-headed Finch** *Aidemosyne modesta*.

Although easily sexed, the Plum-headed has never been a very popular species. However, numbers have never become low enough to endanger its existence in aviculture in the UK. It is a sombre coloured species, but can make an ideal introduction to Australian Finches as it is easily bred. There is one mutation available,

namely the Fawn. Being sex-linked the number of Fawns quickly built up and the mutation is well established in the UK.

**Chestnut-breasted Finch** *Lonchura castaneothorax*.

This, the most popular of the Australian Mannikins, is at present low in numbers in the UK. As with certain other Australian Finch species, the popularity of the Chestnut-breasted appears to wane from time to time. Then, when numbers become so low that potential breeders find difficulty in obtaining stock, the price of the particular species rises dramatically and enthusiasts again take up breeding it. Only a matter of five or six years ago, I found difficulty in disposing of surplus youngsters, yet at the present time, I can sell all the Chestnut-breasted I can breed. There are, at present two mutations available, namely the Fawn and the Crested. The latter is the first feather mutation to appear in any Australian Finch species. As far as I am aware only one Crested has so far entered the UK (via the Continent) and two Fawn (again via the Continent). As with most crested mutations, the Crested Chestnut-breasted Finch is dominant to the Normal and crests can be obtained immediately by mating a Crest (of either sex) to a Normal. The Fawn mutation is sex-linked.

**Yellow-rumped Finch** *Lonchura flaviprymna*.

As well as being somewhat scarce in the wild, the Yellow-rumped is also far from abundant in aviculture, even in Australia. Sexing by visual means can prove almost impossible. However, if youngsters that are moulting from immature to adult plumage are studied regularly, it is possible to sex such birds by their song, as at this age young cocks sing almost continuously. At present numbers are very low in the UK. Even so a small core of enthusiasts continues to breed the species every year. No mutations are known outside Australia. However, in the latter country a Fawn mutation has recently been bred.

**Pictorella Finch** *Lonchura pectoralis*.

This Australian Mannikin is easily sexed but, because of its rather subdued coloration, it has never been very popular with UK aviculturists. The species can prove difficult to breed, although certain enthusiasts have, over the years, experienced many successful breedings. At the time of writing, numbers are very low in the UK and, without the occasional imports from the Continent, there is every possibility the species could be lost to aviculture in the UK. No mutations have yet appeared.

## NEWS AND VIEWS

From Dave Coles

The attempted reintroduction of White-tailed Sea Eagles has been a slow but successful process, increasing in its reproductive output every year. 1991 was a very encouraging year with a total of seven young reared from four of six attempted nestings. Since the initial successful nesting on Rhum in 1985 over twenty have been reared. A detailed account of this increasingly efficient programme is outlined in the latest RSPB Conservation Review, available from RSPB, The Lodge, Sandy, Beds. SG19 2DL price £7.00

There are some noteworthy longevity records in the avian world with the odd one giving an insight into the age limit at which a particular bird breeds. The first Siberian White Crane reared in captivity was fathered by a bird in its late seventies. It reached an age of at least 82 when it died.

The recently published European Cracid Inventory gives details of nearly a thousand individuals of 31 species and subspecies in private and public collections in Europe.

The inaugural issue of the Cracid Newsletter outlines the current research and news items with respect to this South American family. Amongst the many items is one on the rediscovery of the Cozumel Great Curassow *Crax rubra griscomi*.

\* \* \*

Dulcie Cooke writes about the new *Lori Journal International*. "This quarterly magazine provides a much needed vehicle for the exchange of information, news and views on Lories, Lorikeets, Fig Parrots and Hanging Parrots. Breeders of these birds will be able for a fee fixed, at present, at £10 per year for this country, to benefit from and contribute to a journal which is independent of any society. However, it will, according to it's Editor Jos Hubers of Holland, work in close co-operation with the International Loriinae Society, the Belgian Association for Lories, Lorikeets, Hanging Parrots and Fig Parrots, the German Lori I.G., the Papua New Guinea Society, situated in Boroko and various Natural History Museums. Its foreword by Rosemary Low makes an eloquent appeal to Lory breeders world wide to contribute articles and information in order to ensure its future success.

The first issue contains some extremely interesting and in-

formative articles on Lories and Lorikeets. It is to be hoped that future journals will include articles on Fig Parrots and Hanging Parrots for those dedicated aviculturists who keep these birds. There is not a great deal of really up to date information available on the diet and management of Lories and Lorikeets. There appears to be even less on Hanging Parrots and Fig Parrots and so the need for information is especially great.

This magazine is printed on very good quality glossy paper and the pictures, both colour and black and white, are excellent. It is unfortunate that some of the translations into English leave much to be desired and some of the grammar and spelling is incorrect. No doubt this will improve in future issues.

I read a great deal on the subject of Lories and Lorikeets as well as keeping and breeding them and it is a constant source of amazement to me that most keepers and breeders of these delightful birds have a most casual attitude to the subject of diet. Only Stan Sindel of Australia emphasises the exact quantity and protein content of the appropriate diet. In view of the generally agreed need to control carefully the amount of protein fed to these birds in order to avoid the risk of fatty kidney-liver syndrome, it would be helpful if writers would be more specific about the quantitative composition of the ingredients of their dry food or nectar. Where possible it would also be helpful to other breeders if the protein percentage was stated. It was noticeable that no writer mentioned calcium for their Lories and Lorikeets for they really do like cuttlefishbone, grated in the case of small members of the genus *Charmosyna*.

As one would expect, Rosemary Low's long article on some of the *Charmosyna* genus gives invaluable information and the pictures are charming. It is to be hoped that future issues will contain captions for all the pictures. This would be helpful to people who may not be familiar with all the species catered for in this very excellent journal.

The Editor, Jos Hubers, is to be congratulated on producing a greatly needed forum for the breeders of Lories, Lorikeets, Fig Parrots and Hanging Parrots to exchange information which will enable them to keep their birds in the very best conditions possible. This magazine is highly recommended and should have a very successful future.

Anyone interested in receiving copies should apply to the British agent, Mrs. A. Ruggles, Coleman's Hatch, Nr. Hartfield, Sussex TH7 4HG. £10.00 for a year's subscription represents

excellent value for money."

\* \* \*

A large photograph of three well developed Kakapo chicks appeared in "The New Zealand Herald", 3rd June 1992. These are being hand-reared in the Auckland Zoo, having been discovered, deserted by their parents, on Codfish Island near Stewart Island. When they were found they weighed about 90 g only but when the photograph was taken they were eight to ten weeks old and their weights were between 1.2 and 1.4 kg. Their ultimate fate will be decided by the New Zealand Department of Conservation.

\* \* \*

Les Gibson, a member living in Oregon, was incensed by the fact that our recent questionnaire was for British members only and expressed his resentment thus;" Overseas members will no doubt be surprised and annoyed (or, in my case, enraged) to see that a questionnaire on the pros and cons of the magazine has been sent to the **British members only**. Yet again, the Imperialist Council has relegated foreign members to the status of the "Colonial Fringe". Well, I'll have you know that our subscription money is just as good as the Pound Sterling. In fact, mine is even better!". Perhaps Mr. Gibson did not realise that the questionnaire was intended primarily to obtain British members' views concerning the social events of the Society at all of which overseas members visiting Britain are very welcome.

\* \* \*

Six Sparkling Violet-eared Humming Birds have been reared at Slimbridge during the past eight years.

\* \* \*

Visitors to the truly magnificent collection kept by Ruth Ezra and Raymond Sawyer at Chestnut Lodge, Cobham are usually surprised to find there not only many species which they have never seen before but also some the existence of which they have been completely unaware. And so it was when I attended the President's Garden Party in May, for, in one of the large beautifully planted aviaries, landscaped with lawns, rocks and a waterfall, were two pairs of Hodgeson's Grandalas, an incredibly beautiful species

about the size of a Song Thrush but more slimly elegant, with the males almost entirely a glorious shade of bright blue and the females brown, delicately speckled with white. Apparently, they are not uncommon in the wild but their natural habitat is the high Himalayas where they occur in large flocks at an altitude of about 12,000 feet. I have not been able to find any record of their previous importation and I should like to know more about these exquisite creatures.

\* \* \*

The entries for the 1991 Foreign Bird Breeder of the Year competition, sponsored by Cage and Aviary Birds, the Foreign Bird Federation and John E. Haith Ltd. were judged by Bernard Sayers and Will Harrison. They selected, as the overall winner, Roger Cattermole who bred more than three hundred ducks including White-faced and Eyton's Whistling Ducks, Hottentot Teal and many other species. He also bred two Racket-tailed Rollers about which his very interesting article appeared in the *Avicultural Magazine* (volume 98, page 22). The runner-up was Geraldine Stevens in whose aviaries were reared about 150 ducks and geese including five species of Whistling Duck in addition to a Chilean Flamingo, Military and Blue and Gold Macaws and Moluccan and Leadbeater's Cockatoos. Breedings of many species of waxbills and finches including Jacarini and Red-crested Finches (Walter and Jenny Savoury), Orange-winged Pytilia and Dybowski's Twinspots (Keith Baigent), of Parrots including Green-winged, Illiger's and Yellow-naped Macaws, Moluccan, Umbrella, Goffin's and Lesser Sulphur-crested Cockatoos, Double Yellow-headed, Yellow-crowned and Primrose-cheeked Amazons and Painted, Maroon-tailed, Golden-capped and Red-masked Conures (Jim Mathews) and Vernal and Blue-crowned Hanging Parrots, Red-flanked and Meyer's Lorikeets and Celestial Parrotlets (Don and Irene Bardgett), and of softbills, including Asian Hoopoes and Red-flanked Bush Robins (Brian Fisher) and Red-billed Hornbills, White-cheeked and Livingstone's Touracos (Steve Horne) illustrated the avicultural skills of the birds' owners for which they were awarded prizes in the appropriate sections of the competition. Chester Zoo was again the winner in the Zoo and Bird Garden section with the breeding results which have been described by Dr. Roger Wilkinson in the *Magazine*. Stagsden Bird Gardens, where no less than twenty cranes of five different species were reared, were runners up.

\* \* \*

The successful rearing in 1990 of Buffon's Touraco by Steve Horne was documented in the *Avicultural Magazine* (volume 97, page 35). Thinking that this may be a first breeding I inserted a note in the last issue of the magazine asking for anyone who knows of a previous breeding to inform the Hon. Secretary. Such requests, I have learnt, are usually received by members with a conspicuous lack of interest! However, this time there has been a response - and an interesting one too. It comes from our Council Member, Malcolm Ellis, who writes "I have done a little research into the touraco breeding. I think that calling it Buffon's Touraco must be a recent development. I can't recall hearing that name before. I'm surprised by the author's comment that the nominate form has its crest tinted pink at the tip. It is a long time since I have seen this touraco, but we had it at London Zoo, and I have no recollection of there being pink in the crest.

In *Birds of West and Equatorial Africa*, vol. I, pp 552 - 553, Bannerman wrote "*T. persa persa* ranges from the Ivory Coast to Cameroon Mountain; *T. persa buffoni* Shelly from Gambia to western Liberia, in which the black patch below the eye is broader and the white stripe below it is almost imperceptible." "*T. p. zenkeri* Reichenow ranges from French Cameroons to northern Angola and differs from *T. p. persa* in having the white stripe below the eye reduced to a narrow line and not prolonged backwards." "Rather fuller distinctions are given in my larger work."

Jersey bred what they called the Gold Coast Touraco *T. persa persa*, *AM.*, 1971,77,5: 163 - 165. Both parents were brought by Durrell from the Cameroons, so quite obviously belonged to the nominate form. Explaining why the above did not receive an award, Harrison *AM.*, 1973, 79, 6; 224 - 226, wrote "The Gold Coast Touraco, *Tauraco persa*, had already been bred under the name Senegal touraco by Captain H. S. Stokes in 1932." If Capt. Stokes' birds were truly Senegal Touracos, i.e. they came from Senegal, they would have been *buffoni*, that being the race which occurs in Senegal.

I don't have access to the 1932 magazine *AM.*, 1932 (4),10:3-5. Someone who does can perhaps check whether Capt. Stokes described his birds well enough to decide whether they were *buffoni* or the nominate form. Also, he may have noted from which country they originated, which will be helpful. (Capt. Stokes' description of his birds is not detailed enough nor is his statement that their habitat was 'Senagambia to the Congo' sufficiently precise to determine their race. Ed.) As Dave Coles maintains a comprehen-

sive breeding list, what about asking him to check all possible first breedings and let the council have his recommendations?"

\* \* \*

Many Avicultural Society members visiting Holland must have been to Avifauna at Alphen a/d Rijn. It is probably Holland's first bird park and was opened to the general public in 1956. It is a charming place with well planned gardens, beautifully planted and containing large attractive stretches of water. The extensive aviaries, in which commendable efforts are made to imitate the natural habitat of the occupants, house a collection of 450 different species many of which breed successfully, as is illustrated in the following list of 1991 successes which was sent to me by Hans van der Sluis, a member of the park's staff.

Greater Rhea 16, European White Pelican 5, African Cormorant 3, White Stork 3, Sacred Ibis 7, Scarlet Ibis 2, African Spoonbill 3, Plumed Whistling Duck 3, Fulvous Tree Duck 5, White-faced Tree Duck 1, Coscoroba Swan 2, Whooper Swan 1, Trumpeter Swan 7, Black Swan 6, Hawaiian Goose 1, African Shelduck 4, Andean Goose 4, Upland Goose 4, African Black Duck 3, White-cheeked Pintail 10, Cape Wigeon 4, Cinnamon Teal 4, Tufted Duck 8, Ring-necked Duck 3, Maned Goose 3, Mandarin Duck 6, Wood Duck 12, African Pygmy Goose 5, Common Merganser 15, Hooded Vulture 1, Himalayan Monal Pheasant 8, Salvadori's Pheasant 1, Blue Eared Pheasant 7, Reeves's Pheasant 35, Temminck's Tragopan 4, Lady Amherst's Pheasant 25, Golden Pheasant 4, Palawan Peacock Pheasant 2, Peafowl 12, African Black Crake 10, Tristan Rail 4, Sarus Crane 3, Crowned Crane 1, Blacksmith Plover 2, Spur-winged Lapwing 7, Collared Pratincole 2, Pied Imperial Pigeon 4, Black-chinned Fruit Dove 6, Orange-bellied Fruit Dove 2, Superb Fruit Dove 2, Orange-fronted Fruit Dove 2, Celebes Quail Dove 3, Red-throated Ground Dove 3, Luzon Bleeding-heart Pigeon 1, Nicobar Pigeon 2, Common Crowned Pigeon 1, Dusky Lory 2, Budgerigar 25, Green Rosella Parrakeet 1, Pale-headed Rosella Parrakeet 3, Blue-bonnet Parrakeet 6, Cockatiel 4, Monk Parrakeet 5, Snowy Owl 5, Laughing Kookaburra 2, Great Pied Hornbill 1, Red-billed Hornbill 10, White Woodpecker 4, Black-cheeked Woodpecker 8, Toco Toucan 3, Long-tailed Glossy Starling 3, Grosbeak Starling 3, Red-headed Parrot Finch 10, Long-tailed Grass Finch 8, Zebra Waxbill 7, Red-whiskered Bulbul 3, and Yellow-fronted Canary 5.

Ed.

\* \* \*

## LETTERS TO THE EDITOR

Dear Sir,

### GURNEY'S PITTA

It was noted in "News from ICBP (*Birds International* 1989, Vol. 1, No.1; 1991 Vol. 3, No.1) that Gurney's Pitta *Pitta gurneyi*, had not been seen for 34 years and was feared extinct until its rediscovery in Thailand in 1986.

This statement is incorrect for although it has not been seen in the wild for 34 years, its continued existence into the early 1970's was only too well indicated by the international trade in this species. Colin Vince in his book *Keeping Softbilled Birds* published in 1980 writes about a pair of Gurney's Pittas he owned five years previously so one may assume that the birds were in trade in the early to mid seventies. This is substantiated by records at Chester Zoo which indicate that two Gurney's Pittas were received from Mr. Green of Woodhey Bird Farm on 21st march 1971, another male was received on 23rd June 1972 and a female purchased from the dealers Phillips and Heath of Whitchurch on 11th September 1972. Unfortunately these birds failed to establish themselves and no breedings were recorded.

Perhaps this influx of imported Pittas resulted from trapping after the opening up of a particular forest area following logging after which the area no longer remained suitable for the species. I wholeheartedly support the current efforts of ICBP to encourage sustainable management of the remaining remnants of lowland forest still holding Gurney's Pitta and hope that this is not too little too late. Gurney's Pitta, now critically endangered, was listed as of indeterminate status in the 1979 *IUCN Red Data Book* but not included in the 1966 edition or its subsequent revision in 1971. How sad it is to reflect that the international ornithological community, zoos and aviculturists failed then to notice and so were unable to respond to the plight of this lovely bird when they had the opportunity twenty years ago.

The critical status of Gurney's Pitta is now well known and I was shocked and saddened to read in *Birding World*, Vol. 5, No.3 (1992) that illegal trapping over the last two years has reduced the known population from 18 pairs to just two pairs. As aviculturists and

conservationists we must unreservedly condemn such selfish action. There is no excuse for taking these birds into captivity unless as part of a coordinated captive breeding plan approved by the relevant national and international conservation bodies. Gurney's Pitta now looks likely to become extinct as a direct result of illegal trapping - perhaps for the international bird market but who knows?

Roger Wilkinson,  
Curator of Birds,  
Chester Zoo,  
Caughall Road,  
Upton by Chester,  
Cheshire, CH2 1LH England.

\* \* \*

## **AVICULTURAL AND VETERINARY CONFERENCE SUNDAY, 4TH OCTOBER, 1992.**

Aviculture and veterinary science will combine at this conference which will be held at the Zoological Society Meeting Room, London Zoo. The aim of the conference, organised by Avian Research Associates Ltd., is to generate, for their mutual benefit, an exchange of information between the two fields. The programme will cover avian nutrition and deficiencies, drugs, aviculture legislation, husbandry, diseases (e.g. psittacine beak and feather syndrome) and the role of aviculture in veterinary science. Speakers will include Gerry Dorrestein (Association of Avian Veterinarians), Alan Jones, David Alderton, Roger Wilkinson, Fiona Fox, David Parsons and Andrew Gresham.

Detailed proceedings will be available not only to delegates but also to those unable to attend the meeting. The papers are expected to be entertaining, informative and stimulating. Further information may be obtained from the Conference Administrator, Patricia Brewerton, c/o SBS, QMW, Mile End Road, London, E1 4NS (telephone 071-975-5289; fax 081-983-1288).

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THE JOURNAL OF THE AVICULTURAL SOCIETY

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## MEMORIES OF THE BIRD HOUSE, LONDON ZOO

By Malcolm Ellis  
(Wadebridge, Cornwall)

London Zoo's large red-brick Bird House was built originally for reptiles but proved unsuitable and, on completion of the present Reptile House during 1927-28, it was stripped and refitted with aviaries, a new hot water heating system and electric light, etc. Since then it has remained largely unaltered. According to the 1931 Zoo Guide, the large centre aviary (which retains the foundation of what was an enclosure for, I think, crocodiles and the like) was tenanted by birds such as kagus, birds of paradise and glossy starlings. The Greater Bird of Paradise *Paradisaea apoda*, Hunstein's Magnificent *Diphyllodes magnificus hunsteini*, Lesser Superb *Lophorina superba minor*, Red *P. rubra*, Wallace's *Semioptera wallacei*, the Six-plumed *Parotia lawesii*, now often called Lawes' Six-wired Parotia or simply Lawes' Parotia, the Twelve-wired *Seleucidis melanoleuca*, King *Cicinnurus regius* and Violet Manucode *Phonygammus 'jamesi'*, which appears now to be treated as a race of the Trumpetbird *P. keraudrenii*, were all listed as living in the Bird House.

Not that I was there then. I was born in wartime London, almost literally within a stone's throw of the zoo. We were bombed out of our first home and moved to another not far away, just along the street from the house which had been the home of the eccentric Victorian naturalist Frank Buckland and which was owned previously by Dickens' father-in-law George Hogarth. It was in the mid 1950s that I went to work in the Bird House, where I started off doing the 'long side and ends', in those days twenty-two aviaries which lined three sides of the house. They housed mainly a variety of toucans and hornbills. The first bird I was introduced to was a Red-billed Toucan *Ramphastos tucanus*. When I first met the

toucan it seemed to have a rather threatening demeanour but I soon learned that it took exception to the aviary cleaning equipment and otherwise was perfectly tame. Named 'Bill', it often was taken out to sit on a visitor's arm to be photographed and ever so gently it would take a grape held between the lips. There also was a pair of young Red-billed Toucans, a Toco *R. toco*, an Ariel *R. ariel* and a Sulphur and White-breasted Toucan *R. vitellinus* (though the latter name seems perfectly adequate, this toucan tends now to be called the Channel-billed). Added shortly afterwards were a pair of Chestnut-eared Aracaris *Pteroglossus castanotis*, a Sulphur-breasted or Keel-billed Toucan *R. sulfuratus* and, in 1961, a pair of Green-billed or Red-breasted *R. dicolorus* and a Curl-crested Aracari *P. beauharnaesi*, a species new to the collection. It was thought to be only the second to be kept, the first having arrived early the previous year at New York Zoo.

There were two small African Hornbills *Tockus* spp., the slightly bigger Piping Hornbill *Bycanistes fistulator*, ranging up to the Black and White-casqued *B. subcylindricus*, Yellow-casqued *Ceratopgymna elata* and Great Indian *Buceros bicornis*, not confined to India and therefore more properly called the Great Pied, or better still, the Great or Giant Hornbill. The latter, a young male, replaced 'Baby', a female of that species which had died a year or so earlier after 32 years in the Bird House. 'Baby' was renowned for perching on the keeper's arm and taking a grape held between his teeth. The Black and White-casqued species had lived there since 1935 (a distinction it shared with a Common Hangnest *Icterus icterus*, until the latter died in 1961). Later additions were a Wreathed Hornbill *Rhyticeros undulatus*, a Plicated or Blyth's *R. plicatus jungei*; and, later still, a pair of Black-casqued Hornbills *C. atrata*. The female was tame and with jesses on was taken to functions in the Fellow's Restaurant at the zoo. On one such occasion I was asked "Is it a cormorant?" and, on another, a woman guest asked "How do they reproduce, do they lay eggs like budgies?" In this country it is common to see large hornbills which have lost the tip of one or both mandibles, presumably as a result of the tips getting broken off. Why does this happen? Invariably these birds are in outdoor aviaries. Are these accidents caused by the types of wire mesh used on aviaries which are large enough for the hornbills to fly but not for them to manoeuvre properly? This did not happen in the Bird House, where the mesh size is too small for them to get their bill through and is a springy chain-link type of wire that the birds tend to bounce off. *The Avicultural Magazine*,

1958, 64, 5:125 - 126, published the account of the fitting of an artificial tip to the bill of a Ground Hornbill *Bucorvus abyssinicus*, which lost part of its lower mandible, probably as a result of being frightened and hitting the wire netting at Blijdorp Zoo, Rotterdam, Holland.

Other inhabitants of the 'long side and ends' included a trio of Yellow-billed Oxpeckers *Buphagus africanus*, a group of five Tawny Frogmouths *Podargus strigoides*, a male Greater Bird of Paradise and a White-necked Picathartes *Picathartes gymnocephalus*. I was fortunate enough on a few sunny spring mornings to see the bird of paradise perform its display. It would call loudly, the call described as a repeated deep "wank" or "wonk" (Cooper and Forshaw, 1977) and dance back and forth excitedly along the perch. The performance culminated with the male leaning forward, bringing forward his outstretched wings, and 'throwing' up over his back his golden plumes in a spectacular though fleeting climax. Sadly, there were no females to court. When the plumes began to be moulted, the male's food (diced fruit and an insectile mixture with which was mixed a small quantity of minced meat) was liberally dosed with a creamy liquid called, as I recall, 'Scott's Emulsion'! In August 1957 Wilfred Frost returned from the Far East with a varied collection (see News and Views, 1957, 63,6:209) which he housed at the zoo. Included were four male Greater Birds of Paradise, their long plumes stained red-brown by the wood shavings on the floor of their crates. No one here was willing to pay what Frost wanted for them and I believe that all four went to Holland. They were probably the last of their kind seen in Britain. It was Frost's fifty-third and final collecting expedition. He died, aged 82, after leaving for Borneo on yet another collecting trip. I can recall reading in an obituary how, when the Japanese invaded, I think, Singapore, he was interned there and helped feed his fellow prisoners by trapping rats and catching snakes, and how he had his appendix removed in a primitive operation, performed with a knife and fork, if I remember rightly! It was Frost who was commissioned by Sir William Ingram to collect from the Aru Islands Greater Birds of Paradise for release on the West Indian island of Little Tobago, which Sir William purchased when he feared that this species might be exterminated by the millinery trade's demand for its plumes. Forty-eight were released there in 1909 and in 1912 a further three were introduced. A small population still exists on Little Tobago. In 1957 Sir Edward Hallstrom presented London Zoo with thirteen birds of

paradise from New Guinea but, rather than being the supposed immature males, several proved later to be old females. That was more than made up for when, in 1965, he sent over a magnificent collection. Writing of Sir Edward Hallstrom's generous gift of twenty-four birds of paradise, John Yealland (1965) noted that it included five Ribbon-tailed Birds of Paradise *Astrapia mayeri*, which he described as a species of special interest to members of this Society, for it is named after Fred Shaw Mayer. He became a Life Member of the Avicultural Society in 1922 and, before the war, brought to London a number of rare and beautiful Papuan birds. *A. mayeri* remained undescribed until 1939. It was Shaw Mayer who first produced tangible evidence of the existence of this bird of the central highlands in the form of a pair of the male's very long black-tipped white central tail feathers.

Sometimes ignoring the toucans and hornbills, several tanagers and kingfishers, the first Emerald Starlings *Lamprotornis iris* seen alive outside Africa, and lots of other colourful species, in the mid 1950s, the bird which many visitors came looking for lacked bright colours and possessed a bald head! Bald that is except for some barely visible tiny filoplumes along the hind forehead and crown. Taken as a nestling and handreared in West Africa by the Bird House Head Keeper Alf ('Timber') Woods, who some older members may remember, this fascinating bird, the first White-necked Picathartes, back in the days of black and white television, featured in the TV series 'Zoo Quest to Sierra Leone', introduced by David Attenborough. Visitors to the Bird House had difficulty in remembering the bird's unusual name, and even greater trouble in pronouncing it. In spite of that I feel that the name picathartes gives these strange birds a deserved air of mystique. I much prefer it to the practise now of calling this species the Guinea Bare-headed Rockfowl, and the other the Cameroon Bare-headed Rockfowl *P. oreas*. Calling them rockfowl, gives, I feel, quite the wrong impression of them. When I saw David Attenborough describe the picathartes as thrush-like, it caused me to raise my eye-brows, but I realised quickly what he was getting at. Although they are a little larger than the average thrush and have a moderately long neck, legs and tail, giving them an overall length of about 35 cm (14 in), their general shape, posture, and the ways in which they move and behave are noticeably thrush-like. Picathartes do not readily fly and instead progress over the ground by a series of long, very light, springy hops. I remember most the zoo bird's big dark 'button' eyes, how exceptionally alert the bird always was, and the keen interest

it showed in all that happened around it. The two species at present are placed in the Babbler family *Timaliidae*, which includes the Laughing Thrushes *Garrulax* spp., with which they share some characteristics, but differ markedly by being almost totally silent. It has been noted that they bear a resemblance to the Malaysian Rail-Babbler *Eupetes macroceus* and its kin. The 'Zoo Quest' bird was joined in 1957 by a second (a photo of it appeared in the *Avicultural Magazine*, 1957, 63, 5: facing 170), which was handreared by Jim Menzies in Sierra Leone. Unfortunately, after only four months, it died from tuberculosis, which the bird may have contracted before leaving Africa. The same year two small nestlings were sent from Ghana. They thrived at first, but failed to develop further than the nestling stage. These days now handrearing has progressed so far, it is of great concern to look back and remember that we had no tried and tested rearing formula or plan, but simply relied on whoever had time, feeding the nestlings with the standard insectile mixture and mealworms.

Living in the Bird House also was a Grey-necked Picathartes, or Cameroon Bare-headed Rockfowl, the very first example of this subfamily *Picathartinae* ever seen alive outside Africa. Brought from the Cameroons, in 1948, when probably already an adult, it lived in the Bird House for some ten years. Even more curious with a blue and carmine red bare head, this bird received scant attention, though considered rarer than the other and with a remarkable history. Quite miraculously for such a slender-limbed species, it was caught uninjured in a snare set to catch a porcupine. This rare bird, of a species now considered vulnerable, was destined for someone's cooking pot but luckily instead was offered to Cecil Webb who happened to be in the area catching animals to help restock the war-depleted zoo collection. How secretive these birds are can be judged by the fact that neither the boy who snared the picathartes nor several old woodcutters, who had spent most of their lives in the forest, had ever before seen such a bird. Although a large reward was offered, nobody could lead Webb to a nest site. An expert naturalist, he initiated his own search and close to where the bird was caught, to his great surprise and joy, found concealed by vegetation, an almost inaccessible rock face with the remains of six nests. During a whole month in which the rain hardly ceased, he searched without ever seeing a picathartes, until eventually his exceptional perseverance was rewarded by a fleeting glimpse of a single bird and on a later occasion a pair of Grey-necked Picathartes. That exciting episode was described by Cecil S. Webb in

*A Wanderer in the Wind*, subtitled *The Odyssey of an Animal Collector* (Hutchinson, 1953). Webb acknowledged how when writing that book he had drawn freely on articles he wrote for this magazine. His obituary appeared in the *Avicultural Magazine*, 1964, 70, 5: 173 - 176.

For those who do not know, both species build a mud nest resembling that of a Swallow *Hirundo rustica*. That in itself is not especially remarkable, what is, being that these are inhabitants of the forest floor, is the fact that they attach their nest to the roof of a cave or the side of a huge rock face deep in the rainforest. In the latter case, the nest is built beneath an overhang, so that it is sheltered from the rain, which would of course cause it to disintegrate. In November 1960, when the late Ray Shingler and I travelled to Sierra Leone on a collecting expedition, Jim Menzies kindly let us base ourselves with him at Bo School. On 13th May 1961 he took us to a picathartes' nest site. After a hard climb, we came to a gigantic boulder, with four complete nests, two lined and two unlined, plus the remains of four old nests. Two nests were quite low down. Ray also visited an extensive nest site in the Gola Forest near the Sierra Leone and Liberia border. I have some notes



Malcolm Ellis

*P. gymnocephalus* has a creamy yellow-buff head with black 'ear-muffs'.

*P. oreas* has the front of the head blue, and the back part carmine red.

from a long forgotten source, that in Sierra Leone new nests are made at the end of the dry season, i.e. about April, and eggs are laid through the rainy season, i.e. May - October, when there is approx. 241 cm (95 in) of rainfall. Normally there are two clutches, each of two eggs. Apparently, adults commonly return to roost on the old nests, where they are easily trapped.

Both species have since been kept in other collections, mainly in Holland, Germany and the USA, and breedings have been recorded, though, unfortunately, not in this magazine. Trapping for "zoos and private collectors" invariably is at least partly blamed for their vulnerable or endangered status. The numbers kept though have been relatively small, especially in the case of *P. oreas*, and can only have had a marginal effect. With the scarcity of suitable nest sites, the greatest threat must be from deforestation. However, new sites continue to be discovered and their ranges are proving to be not quite so restricted as was thought. A year or so ago on a wildlife radio programme, I heard a representative from an international bird preservation organisation talking about recently discovered nest sites in Nigeria with maybe 500 *P. oreas* present, and nest sites have been found in Gabon.

One other bird I want to mention is the Bird House's male Cock-of-the-Rock *Rupicola rupicola*, which was among a collection of animals brought back from what is now Guyana, by another of the 'Zoo Quest' expeditions mounted jointly by BBC Television and London Zoo. The male spent most days crouched on the ground close to the wire at the front of its aviary. With its eyes almost closed and its head drawn down onto its shoulders, it would slowly turn its head to one side and the front of its erect fan-like crest would hide its beak, making it difficult to be sure which was the front of its head and which was the back. Puzzled visitors would ask "Where's its beak?" There were even some who wanted to know, did the bird have a beak and how did it feed? Almost the only way to get a glimpse of the bird perched normally, was to tip-toe into the house when it was empty, for as soon as the male heard anyone approaching, he dropped to the ground, onto a small area that had become cleared of the sand used to cover the floor. The Cock-of-the-Rock's behaviour attracted the attention of Colin Harrison, who (Harrison, 1961) published a detailed description with sketches illustrating different aspects of the male's behaviour. The bird was handreared in South America and, he suggested that it was so heavily imprinted, it was performing a courtship display directed at the humans all around it. Little was known of the Cock-

of-the-Rock's behaviour and display. The only first hand account he could find was in the 1910 *Avicultural Magazine* by the aforementioned Wilfred Frost. Shortly after Harrison's account, the results of a study in the wild were published by Gilliard (1962), which were referred to by Snow (1982), who also studied this species. Obviously the zoo male regarded the clear area on the aviary floor as his 'court'. In forested mountainous areas, at what apparently is a traditional display ground or 'lek', a number of males gather and each has a 'court', which it watches over. When a female comes into sight, or perhaps merely when sunlight strikes the 'court', the male flies down onto it, landing with a loud squawk and whirr of white flashing wings, produced by the white base of the primaries and narrowed end of the 10th one. On the 'court' it crouches motionless "often for minutes on end" and, probably depending on the position of the female, moves its head to where she gets the best view of his splendid crest. It can be seen that the zoo male's behaviour was an exaggerated form of that display. When a female was introduced, Harrison believed that the male ignored her and continued to posture to passers-by. My memory is of both birds perched uneasily at opposite ends of the aviary, with the male unsettled and occasionally threatening the nervous female, otherwise the two gingerly edged around each other. Not helped by being in a small aviary without any cover, they remained so uneasy in each other's presence, that after a week or so the female was removed. It is likely that the male and female Cock-of-the-Rock come together only fleetingly, probably on the male's 'court', after which the female makes the nest, incubates the two eggs for 27 - 28 days and, lacking evidence to the contrary, it seems sensible to presume that she also rears the young on her own.

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## METHODS USED TO COLLECT DATA ON PARENTALLY RAISED AFRICAN GREY HORNBILL *TOCKUS NASUTUS*

By Michael E. Mace (San Diego Wild Animal Park)

### Introduction

There has been limited information available on the breeding biology of hornbills in the wild (Moreau, 1937; North, 1942; Kemp, 1976; Johns, 1982) and few observations have been made in captivity (Encke, 1970; Choy, 1980; Reilly, 1988). Collecting data on chick development has been difficult because of the family's *Bucerotidae* unusual nesting behaviour. Typically, the female is sealed in the nest for weeks at a time during incubation and partial rearing of the chicks. Although behavioural studies have been done, little has been documented concerning developmental aspects involving the chick's growth rate. This is most likely because of the difficulty in having access to the chicks in the plastered or mudded up nest without harming them and the hen or upsetting the male.

This paper describes the methodology used with a relatively common species over a two year period using the African Grey Hornbill *Tockus nasutus* as a model. In the first year the data collected was in the passive or more traditional manner, i.e. the nestbox was inspected periodically and a hands off approach towards the eggs and chicks was used. In the second year of the study an invasive approach was used which entailed actually removing the eggs and chicks from the nestbox. Once removed the eggs and chicks were measured or weighed and then placed back in the nest.

The African Grey Hornbill occurs in woodlands consisting of large mature trees and in sub-Saharan savannas of thorn scrub in central to southern Africa. In the wild these hornbills are primarily arboreal often hawking insects or picking fruits directly from the trees. They have also been observed to follow troops of Olive Baboons *Papio cynocephalus anubis* in the hopes of catching insects flushed by the troops' gregarious activities (Gore, 1981).

The birds are dimorphic with the adult males having white patches at the base of the upper maxilla. Ridges extend from the base of the lower mandible and cover approximately one third of the surface of the bill. The adult female is smaller in size and her

bill is distinctive in that its colour is red and there are ridges of pale yellow extending across the upper and lower mandibles. The San Diego Wild Animal Park has maintained this species since 18th July 1985, when two pairs arrived. One pair was sent subsequently to another collection on 23rd September 1986.

#### **Data Collecting Method**

Female hornbills typically are sealed inside the nest during incubation and partial chick rearing. Because of this nesting behaviour, there were inherent problems which had to be addressed before the hen was sealed in. When the hen is sealed in the nestbox it is very difficult even to look inside without causing undue stress to the female and hatchlings.

Once the female was inside the nestbox the objective was to gather data on the eggs and chicks. The information which was required from this study specifically was the egg laying intervals, the incubation period and the growth rates of each developing chick from hatching to fledging. Three factors had to be addressed before collecting information could be attempted. First, a nestbox (see diagram) had to be designed with an inspection hole in the side so that the eggs or chicks could be extracted for measurements, photographs, etc. Secondly, a means had to be developed to exclude light during the procedure so that the hen would not overreact to the presence of a hand. By covering the entrance hole with a sheet of black polyurethane and draping additional polyurethane over the inspection hole the desired results were attained, thereby making the inside of the nestbox as dark as possible. This method has been used to hold birds in transport carriers and has been a most effective procedure. Most birds tend to "freeze" when the surrounding area is darkened making them easy to handle. Lastly, a protocol had to be developed to determine the inspection intervals during the egg laying process and chick development. The timing had to be determined by the incubating or brooding hen. Her reaction to the procedures would be the deciding factor throughout the study.

To determine the egg laying intervals the nest box was inspected on a daily basis once the hen was sealed inside the box. The entrance and the inspection holes were covered with polyurethane and a small flashlight was used. The hen would move off the eggs but would not crawl up to the resting shelf. Once the clutch was completed the daily inspections were discontinued.

To determine the incubation period, nestbox inspections were resumed three days before the end of the twenty-eight day incuba-

tion period based on field observations (Kemp, 1976) of the closely related *T. erythrorhynchus*. Again daily inspections of the nestbox were resumed until all of the eggs hatched. Subsequent nest box inspections to collect chick measurements were conducted on a weekly basis. The hornbill female made no attempts to move when a hand was gently placed under her as one might do with an incubating or brooding domestic hen.

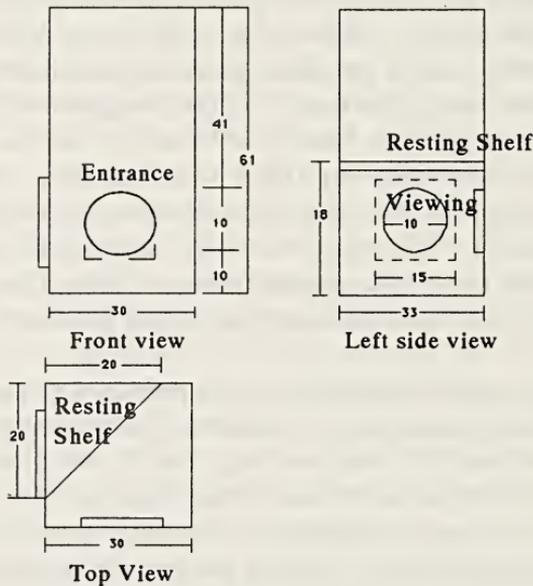
### Enclosure

The pair of African Grey Hornbills are the only birds to occupy their aviary. However they are bordered on either side by other birds including another species of hornbill. The enclosure is 6.1 m long 2.1 m high and 1.2 m wide and is covered by a wire mesh 2.54 cm by 1.27 cm. Food and water are placed near the access door which is sheltered from bad weather. The nestbox is placed under a second shelter at the opposite end of the aviary. Perches placed at both ends of the aviary encourage the hornbills to fly the entire length of the flight. Above the aviary is a manually operated misting system which provides periodic simulation of rainfall at various times during the day. The only vegetation provided in the flight is a Lemon Bottle-brush *Callistemon citrinus*. A hole is dug by the fresh water dish and filled with soil with a high content of clay. The clay serves as one of the components of the plaster used by the hornbills. When the water dish is emptied daily, the water is poured onto the clay keeping it moist. This makes the clay easier to manage by the birds when the plastering phase of nesting begins.

### Nestbox

We have used identically sized nestboxes at the Wild Animal Park for *Penelopides panini manillae*, *Tockus deckeni*, *T. jacksoni*, *T. f. flavirostris*, *T. f. leucomelas*, and *T. erythrorhynchus*. They measure 33 cm x 30 cm x 61 cm and are constructed of CDX exterior plywood 1.27 cm in thickness. The entrance hole is 10 cm in diameter and cork bark is added around the opening to provide a thicker, more substantial base for the mud plaster which the birds apply when nesting occurs. Experience at the Wild Animal Park with other reproducing species of hornbills (*Bucorvus abyssinicus*, *B. leadberti*, *Buceros bicornis*, *Anthracoceros malabaricus*, *Penelopides panini manillae*, *Tockus deckeni*, *T. jacksoni*, *T. f. flavirostris*, *T. f. leucomelas*, and *T. erythrorhynchus*) suggests that the size of the entrance hole is important. The entrance hole should be only large enough to allow the female to squeeze into and out of the nestbox. It is important that efforts are not wasted by the birds trying to close an oversized nest hole as other hornbill species in

our collection have done. In addition, an oversized nesthole may disrupt courtship and make plastering difficult. Nest entrance measurements collected at the Wild Animal Park in 1991 on the much larger species of hornbill, the Javan Rhinoceros Hornbill *Buceros rhinoceros silvestris*, showed that when she emerged from the nestbox, the size of the exit was 26.8 cm by 12.4 cm, which is a fairly small hole considering the size of the species. By comparison the aperture measurements of the African Grey Hornbill after she emerged from the nest were 7.3 cm by 3.1 cm. The thickness or depth of the plaster around the entrance was from 6.2 cm. to 3.1 cm. A resting shelf is provided in the corner of the nest box opposite the entrance which the occupants use when they feel threatened by intruders.



*Tockus Species Nestbox*  
(All measurements in cms)

Pine shavings about 6 - 8 cm deep are placed inside the nestbox. Hornbills may remove some of the shavings to alter the depth. However, we have seen the birds collect leaves and pieces of bark and deposit them in the nestbox (Kemp, 1976). Adding nest material by the birds may accomplish three purposes. First, the fresh nest material may aid in nest sanitation. By laying down a

new layer of material the eggs and chicks are raised above the previous seasons contaminated nest material. Secondly, the decaying new leaf litter may help to regulate the humidity inside the nestbox. Thirdly, certain species of plants have been shown to help suppress invasion by ectoparasites (mites, lice, etc.) which can be detrimental to the nestbox inhabitants (Bucher, 1988).

After a clutch of chicks had been hatched and the chicks fledged the nestbox contents were examined. The leaf litter was arranged in a cup shaped configuration with a depression in the centre of the nest floor. At the shallow point, the detritus was 33 mm deep whereas around the perimeter of the nest floor it was 58 mm deep. The nest was also littered with moulted flight feathers from the female during her incarceration. Minute egg shell fragments were also found. The nest was fairly clean considering it housed the hen and three chicks at a time. All species of hornbills eject debris through the nest entrance to maintain sanitary nest conditions.

#### **Egg laying**

Once the African Grey Hornbill is successfully mudded inside the nestbox, she begins to moult her remiges and rectrices before laying the first egg (Kemp, 1976, personal observation, 1991). These feathers will have grown back before she re-emerges from the nest. The dates of laying the first egg in the two breeding seasons in this study were, 19th May, 1990 and 19th April, 1991.

In the 1991 season, on the eighth day after the hen was sealed inside, the first egg was seen. The eggs are chalk white in colour and their surface is slightly pitted. During the course of incubation the eggs become soiled from detritus, food, faeces, etc. The average dimensions of four eggs laid in 1991 were 34.85 mm x 23.45 mm. The clutch size reported in the wild is 3 - 5. The pair in this study layed a single clutch yearly. Each clutch consisted of four eggs, laid on alternate days. Three eggs hatched in 1990 and two in 1991.

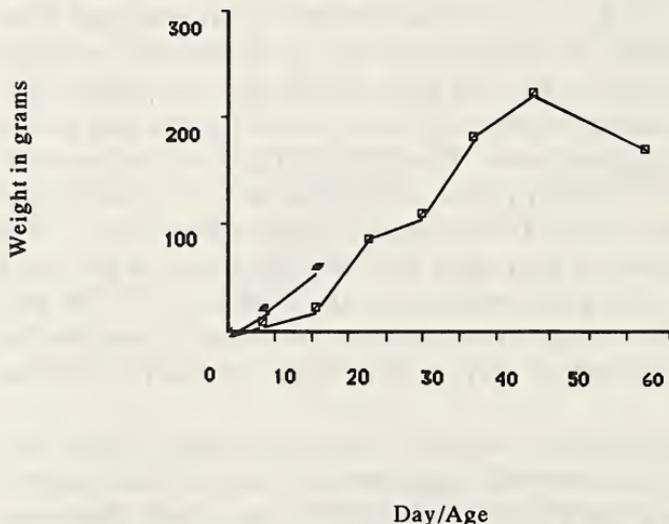
Incubation commences with the first egg (Kemp, 1976). We were unable to determine which eggs actually hatched and can only speculate within a few days as to the incubation period. However, it was between 22 - 28 days based on the dates on which the first egg was layed and the first chick hatched. Marking the eggs would have been fruitless because they are destroyed beyond recognition during the hatching process. The females of this species of hornbill must possess an ability for sperm storage. For example, if the female were to copulate with the male and seal herself in the nestbox on the same day, her first egg may not be layed for eight

days (Kemp, 1976 and personal observation, 1991). Since the maximum clutch size for this species is five eggs, layed at two day intervals, it is evident that the hens can store viable sperm for up to sixteen days.

### Chick Development

The male makes continuous trips to the nest entrance providing food for the female and their brood. Food such as assorted fruits and high protein items supplemented with vitamins and minerals were offered to the adults. However, the adults fed the chicks a high protein diet exclusively consisting of mealworms, crickets, newborn mice, and dogchow.

The African Grey Hornbill chicks hatch asynchronously, are featherless and their eyes are closed. The skin is pink on the head, body, legs, wings as well as on the beak. By the third day the young can be heard vocalizing at a distance of up to twenty feet from the nest. At day twenty, the chick's eyes are still closed. The skin of the chicks remains pink in colour as does the beak.



*The growth rates of two African Grey Hornbill chicks hatched in 1991. One chick died in the nestbox. Note the weight loss of the other chick prior to fledging.*

In 1991, on the twenty-sixth day after the first chick hatched, the hen was heard pounding inside on the mudded entrance. The next day she had escaped from the nestbox and the chicks proceeded to reseal the entrance (Kemp, 1976, and personal observation, 1991).

Unfortunately, one chick was found dead a day later. In 1990 the female came out of the nestbox twenty six days after the first chick hatched. In the wild the average emergence time reported for *T. nasutus* is twenty-one days (Kemp, 1976). A necropsy, performed by San Diego Zoo pathologist, Dr. M. Anderson, on the deceased chick revealed that the chick died at least one or two days before the female left the nest. The cause of death was lack of food. There was no evidence of adipose tissue and only scant gastro-intestinal contents. The oldest chick continued to develop normally and by the twenty-seventh day the feathers on the head, wings, back and tail were beginning to emerge. The eyes opened and the colour of the bill and legs began to change to black. At day thirty-four, the feathers were about half developed and there was no additional change in the bill colour.

At this point in the study (day forty-two) the method was re-evaluated concerning the benefit of continued nest inspections. The concern was to avoid causing the chick to fledge prematurely. In the best interest of the chick, nest inspections were terminated. The chick fledged at fifty-seven days of age. From the period of the heaviest recorded weight of the chick in the nestbox (day 42) until the chick fledged (day 57) the chick lost 28.7% of its body weight. A weight loss of 15% was observed in other hornbill species (*T. nasutus*, *flavirostris*, *erythrorhynchus*) fledglings in the wild (Kemp, 1976). Each of the three chicks in 1990 fledged every other day (fifty-three days of age). The plumage was similar to that of the adults but not as colourful. The colour of the bill was like that of a male but it was shorter in length than in either parent. The parents were very attentive to the chick and at least one of them was always nearby. Both parents continued to feed the chick for fourteen days before the chick began to eat portions of food unassisted.

### Summary

The African Grey Hornbills were studied for a two year period. By comparing female emergence intervals and fledgling periods during passive (1990) and invasive (1991) methods we concluded that the procedure used to collect data on this species of hornbill did not alter the normal emergence or fledgling period. The emergence period or time measured from the hatching of the first chick until the hen escaped from the nestbox was twenty-six days in 1990 and twenty-seven days in 1991. In the wild the reported emergence period is twenty-one days (Kemp, 1976). The manipulations of the chick(s) did not seem to interfere with the fledgling periods. The

fledgling period for the three chicks in 1990 was fifty-three days and fifty-seven days for the single chick in 1991. The overall fledgling period in the wild is  $45 \pm 6$  days for *T. nasutus*, *flavivros-tris*, *erythrorhynchus* (Kemp, 1976). There was a dramatic weight loss by the chick which fledged successfully. Its weight fell by 28.7% before it fledged. Growth rate information such as this can be used when the need arises to hand-rear hornbill chicks (Cunningham-van Someren, 1977). Techniques similar to these can be used to collect information on the more endangered species of hornbills and may help us in our understanding of the biology of the hornbill taxa.

#### ACKNOWLEDGEMENTS

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## BREEDING PESQUET'S PARROT

By Rosemary Low

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

Pesquet's Parrot *Psittrichas fulgidus* is a large red and black parrot which measures about 46 cm and weighs 670 to 800g. Its most distinctive feature is the head which is narrow with the forepart covered in tiny hairs, not feathers. In appearance, behaviour and feeding behaviour it is totally unlike any other parrot. Homberger (1981) studied the morphology and feeding behaviour of Pesquet's and a number of other parrots and found that: "... unlike any other parrot, *Psittrichas* does not "chew" the food morsel before swallowing it." Unlike any other larger parrot, it is therefore unable to eat seed and must be fed mainly on soft fruits.

### Captive History

This species was extremely rare in aviculture until the early 1970s when a number reached Europe, South Africa and the USA. I believe that at least 100 were exported from New Guinea during this decade. Alas, most proved short-lived, and Pesquet's is again very rare in collections. The only breeding successes reported in the avicultural literature are those of de Jager (1976) in South Africa (one parent-reared chick died at 12 weeks), J. Docters van Leeuwen of the Netherlands (Low, 1980, 1986 and 1991), San Diego Zoo (Low, 1980, 1986 and 1991), Los Angeles Zoo (Thursland and Paul, 1987; Cunningham, 1990) and Loro Parque, Tenerife (Low, 1990a, 1990b and 1990c).

I left Loro Parque in February 1989 for Palmitos Park where I have again been extremely fortunate to be involved in the rearing of this unique and rare parrot. Of the more than 200 parrot species I have been privileged to care for, this is my favourite, being endowed with exceptional personality and intelligence.

On 2nd June 1990 a male *Psittrichas* was obtained from Switzerland as a mate for the single female in the collection which is a wild-caught bird. The male had been imported by the Zoological Museum of Zurich in 1972. Over a year after his arrival in our breeding centre I discovered from Dr. Christian Schmidt that during the period the male had been in Zurich Zoo, from 1987 to 1989, its female had produced eight eggs, of which one was infertile, five contained chicks which died within the shell and two were destroyed.

### **Husbandry**

The male was caged in a quarantine area until 18th August. It was in excellent condition and the long quarantine period was a precautionary measure only. After this period the female's aviary was divided by a wire partition across the centre to give two sections, each about 2.3 m long, 1.95 m wide and 2.6 m high. Like most large parrots, they feel more comfortable if they are in an enclosure high enough to look down on people. The aviary is in a block of 14 of a similar size. There is a wide service passage, of which the roof is of welded mesh and is covered with bamboo cane for shade. The aviary roof is also constructed of welded mesh, except 1 m at the back which is solid. There is also a wall 1 m wide at the back of the aviary which forms a shelter but the Pesquet's have never used this section.

On 18th August the male was placed in the front section of the aviary and the female in the rear section. The two birds showed immediate interest in each other and spent much time clinging to the wire partition. The latter was not removed until 1st December, when a television observation camera was set up against the wire mesh of the front of the aviary, covering all the interior. Later a second camera was installed in the centre of the aviary so that the activities of the pair at the nest could be observed more easily. During their first day together the male was possessive regarding the perch in what was formerly his territory. In two or three days, however, they seemed completely compatible and occasionally preened each other's heads.

In captivity the preferred feeding method of this species seems to be to take halved fruits such as apple and pear, or banana with the lower half of the skin intact, which have been spiked on a nail. If the same items are placed in a feeding tray and spiked on to nails, the latter are always eaten first, in my experience. Favoured foods are ripe (not over-ripe) banana, apple, pear, guava, papaya and carrot. Available for about three months of the year are the fruits of *Opuntia* (prickly pear cactus) which are relished. Also eaten are Swiss chard, grapes, soft fresh corn, pomegranate and calabacina (the Spanish variety of courgette). A rearing food made in the park from hard-boiled egg, carrot, whole grain bread and non-fat cheese is also eaten. I have seen Pesquet's fed on quite different diets, including Lory nectar and chopped fruit only, or nectar, rice, fruit and dog chow.

### **Nesting**

On 17th December the female was seen in the nest for the first

time. The nest, an un-excavated 2.4 m high palm log, was placed at the back of the aviary in the left hand corner. On 19th December the observation monitor revealed that the male was feeding the female. Within a few days both birds were spending long periods inside the log, excavating. Every day the aviary floor was littered with the soft pieces of palm fibre. By 1st January they had excavated to a depth of 50 cm, by 5th January to 65 cm and by the 7th to 75 cm. At this stage I became concerned about the female; she was spending long periods inside the log and for a day was coughing constantly, no doubt because of the fine particles ingested during excavation. Therefore, wood shavings were placed in the nest and dampened with a bucket of water. This solved the problem.

By 19th January the pair had excavated the log to a depth of 1.1 m and all the wood shavings had been taken out. These and the palm fibres were carried out of the nest in the feathers. Male and female would shake their feathers and a cloud of shavings or fibres would fall to the ground. On some days, some areas of the aviary floor were completely carpeted. The depth of excavation was 1.25 m by 24th January and 1.4 m by 1st February. Then they had almost reached the bottom of the log which had been solid except for a very small indentation when they started work. The finished surface was neat and even.

Observation of the monitor revealed the first attempted mating on 5th January. It was totally unsuccessful and I believe this to be due to the male's inexperience despite the fact that he had already fertilised eggs. It was not until 22nd January that I observed a possibly successful mating. It lasted no more than 30 seconds but copulation in this species is of much shorter duration than in other large parrots. Copulation usually occurred early in the morning or during mid to late afternoon.

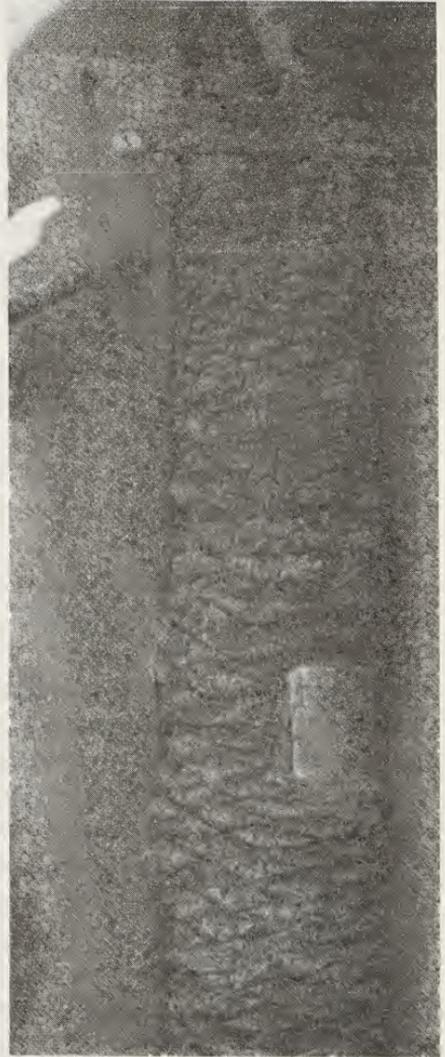
On 4th February the female slept in the nest for the first time. Her first egg was laid the next day. On the following day an inspection door was made in the log at the level of the nest. This might have been judged to be taking a risk which could have caused the female to desert the nest but I was fairly confident that this would not occur because of her calm temperament. I watched the proceedings on the monitor and saw that she returned to the nest and entered within five seconds of the completion of the work which had taken 20 minutes.

Throughout the incubation period the female would leave the nest very briefly, for no more than one minute, on two or three



*Rosemary Low*

*The male of the breeding pair-imported  
19 years before this photograph was  
taken*



*Rosemary Low*

*The palm log excavated by the breeding  
pair  
to below the level of the inspection door.*

occasions daily. She was never seen to feed herself; the male would enter the nest to feed her. The nest was inspected on one occasion and the discovery made that one egg was fertile. The normal incubation period of this species is, I believe, 29 days. The first egg was therefore due to hatch on 6th March and the second on the 9th. On the latter day the behaviour of the male changed. He spent long periods on the nest log perch, something he had not done before. On one occasion when the female left the nest for a slightly longer period than usual I saw him place one leg on the female's back as though he wished to mate with her. However, she returned to the nest. On the following day the male again spent long periods on the nest log perch, sometimes peering inside. On one occasion when the female left the nest, he went inside. His behaviour seemed to indicate that he knew when the egg was due to hatch. However, next day the female left the nest at 8 am and it was obvious that she did not intend to return. The inspection door was removed with the palm fibre which was packed against it. Inside was one egg and the remains of dried yolk from the other. The egg contained a chick which had died about four days before it was due to hatch. The unabsorbed yolk was cultured. *Enterobacteria* were present but these were probably not harmful.

The pair soon commenced to excavate the nest again. As there was not much more that they could do, bucketfuls of wood shavings dampened with water were placed inside. The female had deserted the nest on 11th March. Mating was observed on 22 March and then occurred daily. The female roosted in the nest on the night of 29th March and the egg was laid then or during the next morning. Next day her behaviour gave cause for concern for she was spending much time out of the nest. At 3 pm the egg was cold. Although the female did not look ill, I suspected that something was wrong and removed the egg to the incubator and the female to the clinic. She was given a low perch in a compartment about 1.2 m above floor level. A thick layer of wood shavings was placed on the floor of the compartment. She did not appear sick and laid the second egg at 7.30 pm, next day 1st April. I transferred it, still warm, to the nest of an incubating Umbrella Cockatoo *Cacatua alba* and the cockatoo's single egg was placed in the incubator. This precaution was taken because I did not want both eggs in the same location, also because I prefer that eggs removed as soon as they are laid (emergency procedure only, as chicks are parent-reared wherever possible) are initially incubated by birds.

After two weeks the egg under the Umbrella Cockatoo was

transferred to the incubator. Unfortunately, the embryo died after 20 days. The cause may have been very slight damage to the shell which occurred when the egg was laid or perhaps the jolt that the contents received, or it may have been unconnected with this incident. The other egg developed normally and was removed to the hatcher on 26th April, where the humidity is much higher than in the incubator (which usually is running dry). The chick could not hatch unaided, perhaps because the incubator was too dry for this species and so I removed the chick from the egg on 28th April. I was certain that this was the day the chick would have hatched and hence the incubation period was either 29 or 30 days.

Hand-rearing of the chick is described below. Meanwhile, the female was reunited with the male on 3rd April, in apparently perfect health, and nest excavation commenced immediately. The first egg of the third clutch was laid on 25th April and the second probably on the 28th but the nest was not checked until 30th April. Alas, on 5th May the male entered the nest and ate both the eggs. At least one of the eggs was fertile since part of the shell of one egg was found with the arteries of the developing embryo attached to it.

As the female had laid three clutches in as many months, I did not want her to nest again immediately and therefore the male and female were separated by the wire partition on 6th May. It was the intention to keep them apart for several weeks but both birds spent much time clinging to the wire partition and obviously wanted to be reunited and so on 17th May the partition was removed. Excavation recommenced and, again, wood shavings were placed inside the log and then dampened with water. The first egg was laid early on the morning of 15th June and eaten at once by the male. I had feared that this would occur but was reluctant to remove the male because the female was dependent on him for food. The second egg was laid early on 18th June and removed before it was fully light and placed in the incubator. Plastic pigeon eggs were substituted. Unfortunately, the embryo in the second egg died after a few days.

After some days the female pushed one of the plastic eggs to one side but was diligently incubating the other. On the morning of 13th July, at 11 am, when making a routine inspection of the aviary, I found the female crouched on the floor and the male standing menacingly nearby. Her mouth and the skin below her beak were bleeding where she had been bitten by the male. Fortunately, she had retaliated by biting him below the beak (not severely) and this, perhaps, saved her from further injury. She was suffering slightly from shock and did not protest (as she would have done normally)

when I picked her up in a towel and took her to the clinic. After cleaning her mouth it was evident that her injuries were less serious than the appearance suggested. Three days later she was moved to a small outdoor aviary and 12 days after that she was returned to the breeding aviary, separated from the male by a strong partition of double welded mesh. As a number of instances are known where the male Pesquet's has fatally attacked the female, we considered we were very fortunate that the injuries suffered by the female were not more serious. As it happened, it was not through observation of the monitor that I was aware that the female had been attacked; nevertheless I believe that when this species is kept in captivity, an observation monitor is absolutely essential to safeguard the life of the female. (This also applies to certain cockatoos.)

On being reunited, although separated by the division, both birds became very noisy, making the loud rasping call which seems to come from deep within them. They spent much time clinging to the wire, obviously wanting to be together. At the time of writing (13th October) they remain separated.

#### **Development of Young**

This did not vary from the development, described in detail, in Vol. 29 (pp 103 - 4) of *International Zoo Yearbook*, of the young hand-reared at Loro Parque. Weights of the young Pesquet's, before and after the first feed of the day, are shown in the accompanying table.



*Chick at 21 days old.*

*Rosemary Low*

Day	Weight g.	Day	Weight g.
hatched	18	24	180/206
1	17/19	25	190/212
2	18/20	26	196/224
3	20/22	27	208/230
4	23/25	28	224/252
5	25/28	30	260/284
6	29/32	32	280/326
7	33/35	34	318/358
8	38/41	36	348/396
9	46/51	48	572/not recorded
10	49/52	50	606/662
11	56/60	52	642/694
12	63/68	54	652/716
13	66/74	56	670/730
14	68/74	58	666/706
15	74/88	60	676/720
16	88/102	70	682/718
17	100/112	80	676/682
18	110/122	90	680/690
19	122/134	100	710/722
20	120(some food	110	678
in crop - given	Ringers only)	148	718
21	128/144	166	702 - still being spoon-
22	140/158		fed once daily
23	158/182		

NB The female parent weighs 675 g.

*Weights in grams of Pesquet's Parrot hatched at Palmitos Park on 28th April 1991 and hand-reared from the egg.*

*Weights shown are those before and after the first feed of the day, i.e., at about 7 am.*

### Hand-rearing

The chick was hand-reared on papaya, carrot, wheat germ cereal, Milupa baby cereal, Nekton-Lori and Nekton-MSA (calcium and minerals in powder form) liquidised with bottled water. A liquid sweet-tasting calcium preparation was added to the food (after heating) once daily until the young bird was about two months old. It was spoon-fed as soon as the crop emptied (about every two hours) between 7 am and 10 pm. At about nine weeks it started to nibble at papaya and to drink the warm rearing food from

a small container, held in front of the beak. The manner of feeding was to lap the food quickly with the beak open. (Homburger, 1981, has described how the manner of feeding of this species is totally different from that of any other parrot.) At three months the young bird was nibbling soft fruits, also carrot, and taking large quantities of food from the spoon five times daily. At the end of August, when still being fed three times daily, it was moved to a long cage in front of her parents' aviary so that she could observe their behaviour. On the first day the cage was placed inside the female's aviary but she clung to the wire all day, apparently afraid of the young one, and so the cage and youngster were removed that afternoon. On 10th October the young Pesquet's, which was still being spoon-fed once daily, was moved to a small outdoor aviary to obtain wing exercise.



*Young bird 20th October 1991.*

*Rosemary Low*

At this stage "she" was calm and affectionate, could be readily handled by me and enjoyed having her head scratched. Her reaction to other people varied from friendly to aggressive, depending on the disposition of the person! She was extremely sensitive to what one might describe as the "vibrations" which people emit. For me, there can be no greater pleasure than the rearing of this unique and wonderful species!

#### PRODUCTS MENTIONED IN THE TEXT

NEKTON-LORI AND NEKTON MSA: manufactured by Nekton-Produkte, 7530 Pforzheim, Germany.

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## MANAGEMENT OF A SILVER GULL COLONY AT ST. LOUIS ZOOLOGICAL PARK

By Bruce W. Bohmke and Martha T. Fisher  
(St. Louis Zoological Park, Missouri, USA.)

The Silver Gull *Larus novaehollandiae* occurs in the wild along the coastal regions of southern Australia and Tasmania (Pizzey, 1980). Often found on outlying islands or on large inland waterways, this gregarious species can occur in colonies as large as 100,000 birds (Gibson, 1979).

The St. Louis Zoo has exhibited Silver Gulls since 1969 when two males were imported from the wild. In 1981 an additional captive born female was introduced. Two other gull species, the Grey Gull *L. modestus* and the Band-tailed Gull *L. belcheri* were also present in the collection. In 1985 a hen Silver Gull and a cock Band-tailed Gull paired, successfully hatching two chicks. At this point a decision was made to acquire more Silver Gulls and manage a single species group. The two hybrid chicks, the Band-tailed Gull and the Grey Gull were removed from the collection. Silver Gulls have hybridized with Black-billed Gulls *L. bulleri* in the wild (Harrison 1983). It should be noted that hybridization can occur and, therefore, mixing of gull species should be avoided.

Since 1981 one wild hatched and five captive hatched birds have been introduced into the Silver Gull colony and fifteen successful hatchings have occurred. Currently the St. Louis Zoo exhibits a productive colony of four male, four female and four unsexed birds.

### *Exhibit*

The Silver Gull colony at the St. Louis Zoo is exhibited in a large open flight display which houses thirty species of birds. The exhibit measures 70 m x 26 m x 15 m high with an elevated (1.8 m) observation walkway dividing the structure lengthwise. Within the enclosure, Black Alder trees *Alder nigra* provide shade and roost sites for the birds. The substratum throughout the structure is gravel. Three pools averaging 80 cm in depth make up approximately one third of the aviary ground level.

The Silver Gulls are offered four wooden nesting shelters along the perimeter of the exhibit. The A-frame shelters measure 40 cm x 60 cm x 40 cm high. The gulls have access to the entire aviary. Generally, the birds tend to gather in one corner of the aviary which includes the nesting area.

The gull colony is housed in the open flight exhibit all year. The annual temperature range is from - 24 °C to 38 °C. No adverse effects resulting from climatic extremes have been noted. Unlimited water and plenty of shade are available in cases of extreme heat. Shelter from the wind and warmth from heat lamps is provided in the winter.

### **Diet**

The Silver Gull colony is offered a diet consisting of krill *Euphasia superba*, capelin *Mallotus villosus* and Bird of Prey diet, and is supplemented with Sea World Marine Vitamins. Food is offered in metal pans daily at 0900 h and 1500 h. Four feeding sites are spread throughout the aviary to reduce competition. Sufficient food is provided so that a small amount remains at the next feeding. There is no seasonal variation in the diet components.

### **Banding System and Records**

Numbered aluminium butt-end leg bands are used for each bird to provide permanent identity. Plastic coloured bands are used for identification at a distance. The colony's activities during the breeding and hatching season are recorded. Additionally, individual records are kept for each bird which include data on pairing, egg laying and hatching, and medical problems.

### **Reproduction**

The reproductive season for Silver Gulls at the St. Louis Zoo begins in late February and continues until July, with eleven of the fifteen successful hatchings occurring in the months of April, May and June. Nest sites are loosely grouped in one corner of the aviary and may be as close together as 1.5 m. The gulls in this colony prefer to nest adjacent to a log, shrub, or nest box. Studies have revealed that Silver Gulls in the wild generally select nest sites under trees and bushes to protect the birds from heat stress and predation (Burger and Gochfeld, 1987). These structures may function to provide shelter from wind or precipitation. In addition they may serve as visual barriers and allow the gulls to nest in closer proximity with less agonistic encounters. Nest material is not provided but birds have been seen to collect twigs and rocks to line the nest scrape.

Each pair of gulls may lay multiple clutches. As many as three have been recorded in one season. Average clutch interval for six recorded double clutches was calculated to be 53 days. The average clutch size of 20 nesting attempts is 1.85 eggs, with a range of clutch size from one to three eggs.

Average incubation for four recorded clutches was 24 days with

a range from 23 to 26 days. Three additional clutches removed for artificial incubation approximately one week into incubation had incubation periods of 14, 17, and 18 days.

Chicks leave the nest at three to four weeks of age although independence is achieved gradually at eight to twelve weeks.

### *Hand-rearing*

Natural incubation by the parents is encouraged at the St. Louis Zoo. However, in 1987 two Silver Gull eggs were artificially incubated and successfully hatched. A Petersime Model 1 incubator was set at a temperature of 37.5 °C and humidity of 29 °C wet bulb. The eggs were automatically turned every two hours.

Upon hatching the chicks were placed in a brooder at 35 °C. The temperature was gradually reduced to 29 °C by 21 days of age. A diet consisting of soaked trout chow, krill, capelin, and Bird of Prey diet was offered six times daily. Small pieces of food were offered to the chicks using forceps. Dicalcium phosphate and Sea World Marine vitamins were added to the diet daily. As the chicks increased in size the frequency of feeding declined. The amount offered per feeding increased and the chicks were encouraged to pick up food on their own. Table 1 presents an example.

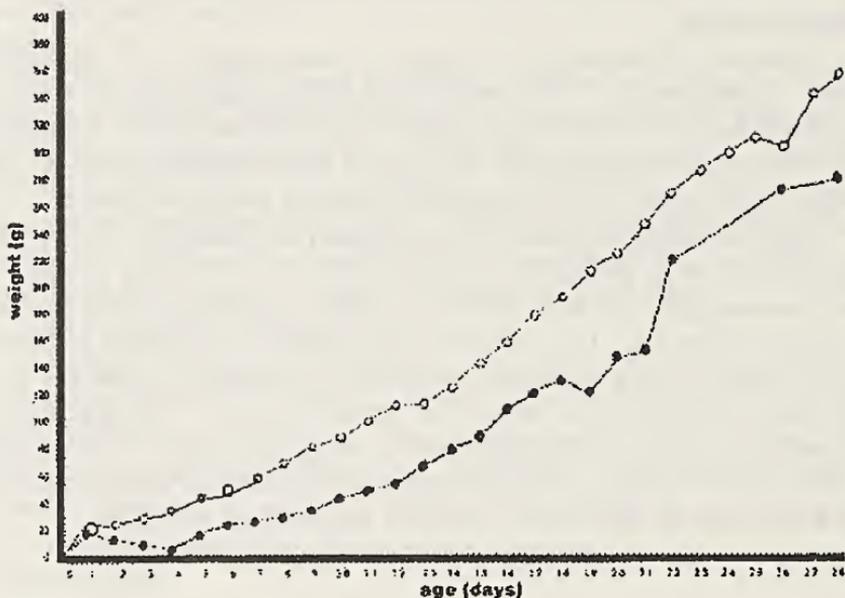
TABLE 1

Age in days	Number of feedings per day	Total intake per day (g.)	Body weight (g.)
2	6	9.6	24.8
7	5	26.7	62.8
12	3	29.2	116.0
17	3	74.0	180.5
22	3	118.0	270.0

*This chick would pick up food by itself when it was eight days old.*

The chicks' weights, shown in Figure 1, and food intake were monitored daily for 28 days. The hatching weight was 26.1 g for chick 1 and 19.5 g for chick 2. Average daily weight gain for the chicks during the first 28 days was 11.8 g and 9.3 g respectively.

FIGURE 1



*Growth curve for two hand-reared Silver Gull chicks to 28 days of age.*

### **Health and Longevity**

The Silver Gull colony at the St. Louis Zoo has experienced no medical problems in the last six years. Since 1987 five deaths have occurred. Of these, three have been the result of trauma most likely due to aggression between species. The causes of the remaining two deaths, one of which occurred shortly after hatching, were undetermined. One bird in the colony is over 30 years old. Three other birds of which the dates of hatching are unknown were a minimum of 19, 18, and 15 years of age at death. Each of these birds was involved in reproductive efforts during the year before its death.

### **Conclusion**

Silver Gulls have been shown to be easily managed in captivity. They exhibit longevity of over 30 years and have few health problems. Mortality causes include trauma and problems associated with hatching. Silver Gulls may be maintained in a colony

setting and will reproduce successfully without human intervention. If necessary, eggs can be hatched artificially and chicks can be reared with few problems. Inter-species aggression may be a problem in mixed species displays. Hybridization between gull species is possible. Silver Gulls have proven to be adaptable to climatic extremes and need little in the way of protection from heat or cold.

#### PRODUCTS MENTIONED IN THE TEXT

- NEBRASKA BRAND BIRD OF PREY DIET: manufactured by Central Nebraska Packing Inc., PO Box 550, North Platte, Nebraska 69103, USA.
- PETERSIME MODEL 1 INCUBATOR: manufactured by Petersime Incubator Company, 300 North Bridge Street, Gettysburg, Ohio 45328, USA.
- SEA WORLD MARINE VITAMINS: multi-vitamin, distributed by Sea World Inc., 7007, Sea World Drive, Orlando, Florida 32821, USA.
- TROUT CHOW: manufactured by Purina Mills, 1401, South Hanley, St. Louis, Missouri 63117, USA.

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## DISPLAY AND ATTEMPTED BREEDING OF THE LESSER BIRD OF PARADISE

By Lawrence Kuah (Singapore)

Before the CITES (Convention on the International Trade in Endangered Species of Wild Flora and Fauna) agreement or Washington Convention was signed by Singapore in 1986, small numbers of various species of Birds of Paradise *Paradisaea* were occasionally available from commercial dealers. It was during this time that I obtained my group of Lesser Birds of Paradise *Paradisaea minor* with several other species of this genus, including some of *Diphylodes*, *Cicinnurus*, *Seleucidis* and others, like *rubra*, in the same group. They have all been placed under Appendix II and are protected under international law, even in their native Indonesia, where they are known as Cenderawasih or Manuk Dewata (birds of the gods). This extremely fascinating genus of birds has long been held in awe and wonder. Trends in fashion during the nineteenth century required huge amounts of skins from various *Paradisaea* species and it was because of this trade in skins that Birds of Paradise became endangered species.

The Lesser Bird of Paradise is smaller than the closely related Greater Bird of Paradise *Paradisaea apoda* from the Aru Islands. It also has more yellow on its back, stripes of yellow on the wing coverts and plumes of a different structure. These beautiful birds are found in the Indonesian half of Irian Jaya and on the islands of Misool and Japen in Geelvink Bay. Another population of these birds of a different sub-species *finschi* is found in the other half belonging to Papua New Guinea. The island of New Guinea, being the largest island in the world and so isolated, has enabled nature to do her best at evolution in producing such a bizarre and unique group of birds as the Birds of Paradise.

Initially, an attempt was made to keep my birds in a mixed collection and to stimulate their display behaviour by providing a communal display tree. A large aviary of dimensions 30' x 12' x 8' high was used and the display tree was a stunted guava situated somewhere in the middle. Some other species were present, prior to the introduction of the group of eight male and three female Lesser Birds of Paradise and no problems were experienced. There were nine Rothschild's Mynahs *Leucopsar rothschildi*, 14 Red-fronted (Javan) Laughing Thrushes *Garrulax rufifrons*, 3 Blue-faced Honeyeaters *Entomyzon cyanotis* and ground birds including

a pair of Rusty-naped Pittas *Pitta oatesi*, a pair of Malay Peacock Pheasant *Polyplectron malacense*, one Mountain Peacock Pheasant *Polyplectron inopinatum* and four Victoria Crowned Pigeons *Goura victoria*.

It was not very long before all of these had to be removed because of the highly aggressive nature of the Birds of Paradise. Anyway, the aviary was rather crowded. When the Birds of Paradise were first introduced, there was immediate conflict with the Honeyeaters and the Crowned Pigeons. The former fought viciously and matched every sound that their aggressors made. The Crowned Pigeons, on the other hand, struck out viciously with their wings not allowing any Birds of Paradise to roost near them. They were removed as were the Peacock Pheasants which were rare and valuable especially the Mountain Peacock Pheasant. Incidentally, the Malay Peacock Pheasants bred for the first time almost immediately after being removed from the communal aviary. There was a very unfortunate incident which necessitated the removal of the other species in late September 1989, when two Rothschild's Mynahs, which were bred by myself in previous years, died suddenly from coccidiosis. All the large passerine species were transferred to individual box cages and treated with Baycox (Bayer Products, Germany) as recommended by the manufacturer. After treatment for nearly six weeks cultures of the birds' excreta were free from protozoa. The aviary was disinfected and 14" of topsoil was dug out and replaced with well draining gravel. It was very unfortunate that I lost the pair of Rusty-naped Pittas which were among my favourite birds. (I must stress that Rothschild's Mynahs and, to a lesser extent, Birds of Paradise are extremely susceptible to coccidiosis and die quickly without proper treatment.)

During the time of treatment and separate caging all the male Birds of Paradise became fully plumed. In some of the older birds the plumes were of incredible length and trailed out when they perched. It was then that I decided to devote the entire aviary to them, as they greatly fascinated me with their incomparable beauty. They were at their most active in the morning, particularly in the early dawn, when one could make out only their faint silhouettes in the cool and moist mist around their aviary. The females were observed to be actively persecuting each other and, at times, the fights were so fierce, that all I could make out of them, was a violently, shrieking shape in which they were furiously damaging each other with their beaks and nails. Two females were removed leaving behind the largest and most formidable looking. Previ-

ously, I had read Kerry Muller's account of the breeding of the Raggiana Bird of Paradise *Paradisaea raggiana* at the Taronga Zoo in the International Zoo Yearbook. No reasons were given for his conclusion that "females must never be housed together." Now, I know why.

The group appeared to have settled down well and at all times of the day, far sounding, unmistakable calls of the birds could be heard throughout the compound. These calls sounded like *Wonk! Wonk! Wah! Wah! Wonk! Wonk! Wonk! Wonk!* sometimes repeated two or three times in succession. The female also contributed to the total amount of noise created. This was when I started to observe the wonderful, captivating courtship displays of the males. One of the most frequently seen was performed by several males flying to and fro simultaneously, sometimes gliding with half-spread wings, flitting about like enormous flame-yellow and chocolate-brown butterflies. The female, to my surprise, appears unmoved by all these displays and moves around actively, focusing her attention on mealworms or other foods provided for birds in the adjoining aviaries. When she finally pays attention, or at least feigns it, by flying to the far end of the guava tree, opposite the "dancing arena", the males work themselves into a frenzy, literally, throwing themselves upon the low, wide-spreading branches and dancing. Initially, it is not usually directed at the female, for this seems to cause the female to move away. They start simply, by calling excitedly, clapping their bills together and with thrusting motions shaking their fantastic plumes into place and exhibiting the most brilliantly coloured portions of the flank. This is often accompanied by wing flapping and "freezing" along the branch at an angle of nearly 90 degrees. Every hop is carefully executed and the plumes wave violently at each exertion. Now, it seems that all the birds are in some sort of trance, oblivious to what is happening around them. Once they have "danced" their way closer and closer to the female, they take turns doing lateral displays facing her with their lemon yellow eyes, and iridescent, emerald green throats and then, with their backs towards her, with their long "wires" dangling and vibrating and their wings fanning with rhythmic movements. Very rarely, if the female is actually interested in the bizarre display, one or two males, which she appears to have selected move nearer and nearer to her, as if given a cue. If any other male which she regards as not captivating enough sidles up, she flies off and the whole dance comes to an abrupt end and the male birds wake up out of their entranced state. The successful males, when they reach her,

feverishly flap their wings and often, "slap" her as their movements get more and more excited and they begin to overwhelm her. Pecking takes place when this state is reached and the intensity of the display ends in a few seconds of copulation, usually repeated, before she flies away.

These birds are maintained on a daily diet of fruit, usually bananas and papayas offered every afternoon. A staple diet, available at all times, is a commercial poultry crumble (18 to 20% protein) and on odd days, about 5 grams of ground raw beef or 20 meal worms for each bird. A vitamin supplement like Nekton T and Bio (Nekton products, Germany) is given once a week on the fruit and once monthly a calcium supplement is mixed with the crumble. Cooked, unpolished rice is occasionally mixed into the crumble and kitchen scraps like meat off the soup bones or pulverised egg or vegetables are often added. Powdered glucose is sprinkled on some foods in which the birds might not show an active interest. These birds resemble shrikes in some ways and when offered skinks (lizards) or young mice, they bring their prey up to the perches and behave very skilfully like shrikes or butcherbirds, using their feet like hands and eating their meat leisurely. The female has made at least two attempts to lay her eggs after copulation and many attempts to build a nest. She stripped living foliage from the other small bushes and built her nest at the extreme end of the aviary. However, the nest was always mysteriously torn into pieces and the eggs suspected to be in them were eaten. I have learned recently from Dr. K. C. Searle, Honorary Zoological Curator at the Hong Kong Zoological & Botanical Gardens, who bred and reared successfully several young from the Raggiana Bird of Paradise *Paradisaea raggiana augustvictoriae* that the males must be removed after successful copulation and the female left alone, unmolested, to incubate her egg and raise her chick. I have taken his advice and hope that breeding this wonderful species in captivity will soon become a reality and that I shall be able to report about Bird of Paradise chicks in the future. However, in conclusion, I should mention that a colony of Birds of Paradise can not always be kept together for this particular female has lost the sight of one eye which was punctured by a male's foot during a fight. The aviary for these birds must be heavily shaded and planted, as the yellow on the head and shoulders soon fades to a pale cinnamon if they are exposed frequently to strong sunlight.

Careful and close supervision of the birds is advised for aviculturists intending to breed Birds of Paradise in a lek, display colony.

I should be grateful if other aviculturists, who have had similar or better successes in managing and breeding these birds, would contact me in Singapore.

\* \* \*

Correspondence should be addressed to Mr. Kuah c/o the Avicultural Society at Bristol, and this will be forwarded to him.

Ed.

\* \* \*

## THE PRESIDENT'S GARDEN PARTY

I was delighted to be one of about a hundred Avicultural Society members and guests who attended the President's Garden Party at Chestnut Lodge, Cobham on Sunday, 31st May 1992. We were received and welcomed by our President, Ruth Ezra, with her characteristic charm and were conducted around the gardens and aviaries by Raymond Sawyer with his boundless, infectious enthusiasm. We were shown many species of beautiful, mostly rare and frequently unusual foreign birds in superb condition. Housed, usually in pairs, in well designed and beautifully planted aviaries, many were breeding successfully, some species for the first time in captivity. The avicultural ambience was quite unique and illustrated Raymond Sawyer's considerable flair for combining birds and plants with remarkable artistry. It also demonstrated his real love for birds and dedication to aviculture. Tea in the sun on the lawn in the lovely gardens provided us with an opportunity to thank our hosts for their kind and generous hospitality. It is a pleasure for me to express here our gratitude again.

Ed.

## BREEDING ACTIVITIES IN THE BIRD COLLECTION OF THE ZOOLOGICAL SOCIETY OF SAN DIEGO 1991

By Alan Lieberman  
(Curator/Ornithology, San Diego Zoo),  
Cynthia Kuehler  
(Zoologist, Zoological Society of San Diego),  
William Toone  
(Curator/Ornithology,) and  
David Rimlinger  
(Assistant Curator/Ornithology,)  
(San Diego Wild Animal Park).

The 1991 breeding season for the combined bird departments of the Zoological Society of San Diego attained new levels for our institution and perhaps for aviculture as well. The number of species bred, chick survivability and first breedings have resulted in a most satisfying season. The following table provides a summary of all species bred, number of chicks hatched, method of rearing (parent vs. artificial) and survivability of all chicks hatched (>30 days).

To summarize the 1991 breeding efforts of the San Diego Zoo and the San Diego Wild Animal Park (the two facilities comprising the Zoological Society of San Diego), there was a total of 163 species bred; 120 species at the Zoo and 58 species at the Park. (The sum of these two subtotals is actually 178, indicating that there were 15 species bred which were common to both collections). There was a total of 523 chicks hatched and reared utilizing artificial incubation and hand-rearing techniques and of 404 chicks hatched and reared naturally under their parents. Of these hatchlings, 394 chicks survived more than 30 days in the former and 302 chicks survived in the latter category.

In the Avian Propagation Centre (APC), where the majority of artificial incubation and hand-rearing takes place, a total of 558 eggs were set, of which 424 were fertile (76% fertility). Of these, 285 chicks hatched (67% hatchability). This figure represents the total number of eggs, whether cracked, in poor embryonic condition, suspected dead upon arrival, excessively cooled (abandoned), etc. Discounting those eggs which were fertile, but not potentially

hatchable, the calculated hatchability would be much higher.

Of special note in 1991 was the breeding success of a number of species. In particular, were the Mantell's Brown Kiwi (5th year in a row), Milky Stork (3rd year in a row), 16 species of duck, California Condor (3rd year in a row), African Pygmy Falcon (3rd year in a row), Congo Peacock, White-bellied and Buff-crested Bustard, Chestnut-bellied Sandgrouse, 31 species of pigeon, Guam Kingfisher, 9 species of Babbler, Oriole Warbler (*moho*), Malachite Sunbird, 9 species of tanager, 5 species of starling, Thai Black Drongo and Malayan Crested Jay. Many of these breedings were the first for our institution and were perhaps the first in captivity.

In addition to the above breedings, much effort was dedicated to the recovery programme of the San Clemente Island Loggerhead Shrike *Lanius ludovicianus mearnsi*. Now numbering less than 25 individuals, restricted to San Clemente Island 112 km off the coast of San Diego, this subspecies of shrike is the object of an intensely managed recovery effort funded and coordinated by the U.S. Navy. The Zoological Society in 1991 developed the protocols for the incubation and the artificial rearing of the mainland subspecies *L. l. gambeli* of shrike as well as the endangered island subspecies. These protocols will be used in 1992 to incubate eggs artificially and hand-rear neo-natal shrikes removed from wild nests in an effort to produce double and triple clutches of the island shrikes.

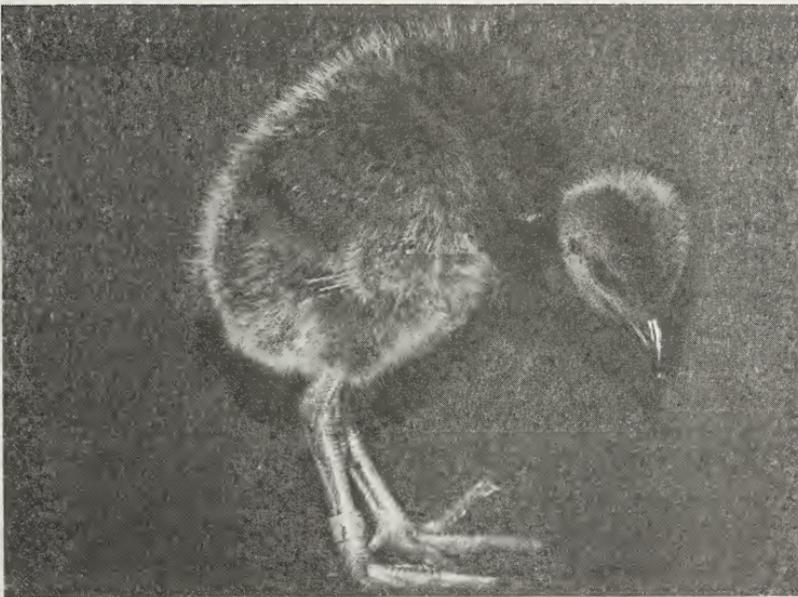
Two species bred at the Park were particularly notable. The Wild Animal Park has always been known for its breeding of large birds (herons, cranes, condors, waterfowl, etc.) but in 1991 two species were bred which belong to the other end of the avian spectrum, the Oriole Warbler *Hypergerus atriceps* and the Thai Black Drongo *Dicrurus microcercus thai*. Both species bred on exhibit in large mixed-species aviaries.

One pair of Oriole Warblers built their nest in an enclosed natural fibre basket that resembles their suspended nest in the wild. The nest basket was located about 1.5 m. high and was lined primarily with jute. Several two egg clutches were laid, of which only one clutch of two chicks was successfully hatched and reared. The eggs were light blue with light brown spots. Both parents participated in incubation and the rearing of the young. The chicks were raised mainly on mealworms and crickets. At fledging the youngsters were simply smaller, duller, essentially tail-less versions of the adults (details of this breeding will be published later).

A pair of Thai Black Drongos nested in a large walk-through aviary. Their bulky cup nest was built over water in a *Ficus* tree

approximately 7.5 m. high. Incubation and feeding were shared by both parents and two chicks successfully fledged. Only mealworms were observed being fed to the young but other insects were probably caught in the exhibit. In the past, the adult drongos have been observed catching bees from a natural hive inside the exhibit.

In 1992, the goals of the combined bird departments of the Zoological Society include continued work with the shrike and California Condor recovery programme, as well as the Andean Condor recovery programme in Colombia, a new programme focusing on the recovery of the endangered California Clapper Rail and, as always, the challenge of breeding new species. Not overlooked is the need to concentrate on those species that have already been bred in captivity but are in need of continued captive propagation to ensure their presence in aviculture. Of primary importance in all of these goals is to organize and share the information gathered in each of these programmes. It remains a key goal of the Zoological Society of San Diego to document all of our activities in order that we can duplicate our successes, avoid unnecessary failures, and assist others in doing the same.



Ron Garrison

The Grey-winged Trumpeter, *Psophia crepitans*, is a species which has bred very well at both the San Diego Wild Animal Park and the San Diego Zoo.

101 chicks have been hatched since 1985, from three different sets of parents. Breeding units were either in pairs or in a trio (2.1)

## BIRDS HATCHED AT THE ZOOLOGICAL SOCIETY OF SAN DIEGO IN 1991

Column 1 shows the numbers hatched by the parents, 2 those hatched artificially and 3 the total numbers. Figures in brackets represent chicks which did not survive for 30 days.

	1	2	3
Mantell's Brown Kiwi	0	2(1)	2(1)
<i>Apteryz australis mantelli</i>			
Eastern Brown Pelican	3(1)	0	3(1)
<i>Pelecanus o. carolinensis</i>			
African Darter	0	1(1)	1(1)
<i>Anhinga rufa</i>			
Goliath Heron	2	3	5
<i>Ardea goliath</i>			
Honduran Boat-billed Heron	3(1)	8	11(1)
<i>Cochlearius c. ridgewayi</i>			
Milky Stork	1	2	3
<i>Mycteria cinerea</i>			
Hermit Ibis	13(3)	0	13(3)
<i>Geronticus eremita</i>			
Hadada Ibis	2	2(1)	4(1)
<i>Hagedashia h. nilotica</i>			
Roseate Spoonbill	1(1)	0	1(1)
<i>Ajaia ajaja</i>			
Crested Screamer	1(1)	1	2(1)
<i>Chauna torquata</i>			
Magpie Goose	0	3	3
<i>Anseranas semipalmata</i>			
Swan Goose	0	1	1
<i>Anser cygnoides</i>			
E. Indian Whistling Duck	0	7(2)	7(2)
<i>Dendrocygna a. arcuata</i>			
White-faced Whistling Duck	0	74(13)	74(13)
<i>Dendrocygna viduata</i>			
Mandarin Duck	0	6	6
<i>Aix galericulata</i>			
Red-billed Pintail	0	6	6
<i>Anas erythrorhyncha</i>			
Falcated Duck	2(2)	0	2(2)
<i>Anas falcata</i>			

Baikal Teal	0	4	4
<i>Anas formosa</i>			
Hottentot Teal	0	25(2)	25(2)
<i>Anas punctata</i>			
South African Black Duck	0	6(1)	6(1)
<i>Anas s. sparsa</i>			
Ringed Teal	0	8(2)	8(2)
<i>Callonetta leucophrys</i>			
Marbled Teal	1(1)	0	1(1)
<i>Marmaronetta angustirostris</i>			
Hooded Merganser	0	2(2)	2(2)
<i>Mergus cucullatus</i>			
Red-crested Pochard	0	4(1)	4(1)
<i>Netta rufina</i>			
Common Shelduck	0	5(1)	5(1)
<i>Tadorna tadorna</i>			
California Condor	0	4	4
<i>Gymnogyps californianus</i>			
King Vulture	1	0	1
<i>Sarcorhamphus papa</i>			
Andean Condor	0	1	3
<i>Vultur gryphus</i>			
Hooded Vulture	0	1	1
<i>Necrosyrtes monachus</i>			
New Hebrides Peregrine Falcon	3		3
<i>Falco peregrinus nesiotus</i>			
African Pigmy Falcon	4(1)	3(2)	7(3)
<i>Polihierax semitorquatus</i>			
Crested Guan	0	2	2
<i>Penelope p. purpurascens</i>			
Congo Peacock	1	0	1
<i>Afropavo congensis</i>			
Arabian Red-legged Partridge	0	13(1)	13(1)
<i>Alectoris m. melanocephala</i>			
Arabian Sand Partridge	0	34(5)	34(5)
<i>Ammoperdix heyi intermedia</i>			
Chestnut-bellied Hill Partridge	0	11(3)	11(3)
<i>Arborophila javanica</i>			
Ferruginous Wood Partridge	0	4(1)	4(1)
<i>Caloperdix oculea</i>			
Blue Eared Pheasant	0	18(3)	18(3)
<i>Crossoptilon auritum</i>			

Himalayan Impeyan Pheasant	0	18(3)	18(3)
<i>Lophophorus impeyanus</i>			
Palawan Peacock Pheasant	0	2(1)	2(1)
<i>Polyplectron emphanum</i>			
Crested Wood Partridge	0	24(12)	24(12)
<i>Rollulus rouloul</i>			
Cabot's Tragopan	0	1	1
<i>Tragopan caboti</i>			
Temminck's Tragopan	0	11	11
<i>Tragopan temminckii</i>			
Manchurian Crane	0	1	1
<i>Grus japonensis</i>			
Grey-winged Trumpeter	0	10	10
<i>Psophia crepitans</i>			
Guam Rail	15(3)	3	18(3)
<i>Rallus owstoni</i>			
Sun Bittern	1	3(3)	4(3)
<i>Eurypyga helias</i>			
White-bellied Bustard	0	6(1)	6(1)
<i>Eupodotis senegalensis</i>			
Buff-crested Bustard	0	9	9
<i>Lophotis ruficrista</i>			
Cream-colored Courser	0	3(2)	3(2)
<i>Cursorius c. cursor</i>			
Crowned Lapwing	0	2	2
<i>Vanellus coronatus</i>			
Red-wattled Lapwing	0	3	3
<i>Vanellus indicus</i>			
Chestnut-bellied Sandgrouse	0	4	4
<i>Pterocles exustus</i>			
Nicobar Pigeon	4	0	4
<i>Caloenas n. nicobarica</i>			
Green-winged Dove	2(1)	0	2(1)
<i>Chalcophaps i. indica</i>			
South African Speckled Pigeon	5	1	6
<i>Columba guinea phaenota</i>			
White-headed Pigeon	0	1	1
<i>Columba leucomela</i>			
Ashy Wood Pigeon	3(1)	0	3(1)
<i>Columba pulchricollis</i>			
Picui Dove	1(1)	0	1(1)
<i>Columbina p. picui</i>			

Pied Imperial Pigeon	6	0	6
<i>Ducula b. bicolor</i>			
Luzon Bleeding-heart Dove	0	1	1
<i>Gallicolumba luzonica</i>			
Western Golden-heart Dove	2	4	6
<i>Gallicolumba r. rufigula</i>			
Bar-shouldered Dove	2	1	3
<i>Geopelia humeralis</i>			
Papuan Mt. Pigeon	1	0	1
<i>Gymnophaps albertisii</i>			
Wonga Wonga Pigeon	1(1)	2	3(1)
<i>Leucosarcia melanoleuca</i>			
Bare-faced Ground Dove	3	2	5
<i>Metriopelia c. ceciliae</i>			
Black-winged Ground Dove	8(1)	0	8(1)
<i>Metriopelia melanoptera</i>			
Green-naped Pheasant Pigeon	0	11(2)	11(2)
<i>Otidiphaps n. nobilis</i>			
Squatter Pigeon	14(6)	13(11)	27(17)
<i>Petrophassa scripta</i>			
Black-backed Fruit Dove	0	2(1)	2(1)
<i>Ptilinopus cinctus albocinctus</i>			
Coronated Fruit Dove	4(2)	5(2)	9(4)
<i>Ptilinopus coronulatus geminus</i>			
Orange-bellied Fruit Dove	2(1)	0	2(1)
<i>Ptilinopus iozonus</i>			
Jambu Fruit Dove	4(3)	9(6)	13(9)
<i>Ptilinopus jambu</i>			
Black-chinned Fruit Dove	1(1)	0	1(1)
<i>Ptilinopus l. leclancheri</i>			
Yellow-breasted Fruit Dove	0	1(1)	1(1)
<i>Ptilinopus occipitalis</i>			
Pink-spotted Fruit Dove	3	5(2)	8(2)
<i>Ptilinopus perlatus</i>			
Beautiful Fruit Dove	5(4)	5(3)	10(7)
<i>Ptilinopus pulchellus</i>			
Superb Fruit Dove	0	8(7)	8(7)
<i>Ptilinopus superbus</i>			
Philippine Turtle Dove	9(3)	0	9(3)
<i>Streptopelia b. dussumieri</i>			
Red-eyed Dove	3	0	3
<i>Streptopelia semitorquata</i>			

Senegal Dove	6(1)	0	6(1)
<i>Streptopelia s. senegalensis</i>			
White-faced Cuckoo Dove	2	0	2
<i>Turacoena manadensis</i>			
Black-billed Wood Dove	7(3)	0	7(3)
<i>Turtur abyssinicus</i>			
Galapagos Dove	5(3)	4(1)	9(4)
<i>Zenaida g. galapagoensis</i>			
Stella's Lory	0	3	3
<i>Charmosyna papou stellae</i>			
Red-flanked Lorikeet	1	1(1)	2(1)
<i>Charmosyna p. placentis</i>			
Black-winged Lory	3	2	5
<i>Eos Cyanogenia</i>			
Musschenbroek's Lorikeet	2	0	2
<i>Neopsittacus musschenbroekii</i>			
Perfect Lorikeet	1	0	1
<i>Trichoglossus euteles</i>			
Goldie's Lorikeet	1	0	1
<i>Trichoglossus goldiei</i>			
Red-collared Lorikeet	1	1	2
<i>Trichoglossus h. rubritorquis</i>			
Iris Lorikeet	3	2	5
<i>Trichoglossus i. iris</i>			
Leadbeater's Cockatoo	5	0	5
<i>Cacatua l. leadbeateri</i>			
Slender-billed Cockatoo	1	1	2
<i>Cacatua t. tenuirostris</i>			
Red-tailed Black Cockatoo	1	0	1
<i>Calyptorhynchus magnificus</i>			
Rose-breasted Cockatoo	5	0	5
<i>Eolophus r. roseicapillus</i>			
Cockatiel	10	0	10
<i>Nymphicus hollandicus</i>			
Kea	0	1(1)	1(1)
<i>Nestor notabilis</i>			
Black-cheeked Lovebird	5	0	5
<i>Agapornis nigrigenis</i>			
Black-winged Lovebird	2(1)	2(2)	4(3)
<i>Agapornis taranta</i>			
Yellow-headed Amazon	0	2	2
<i>Amazona ochrocephala oratrix</i>			

Hyacinth Macaw	0	1	1
<i>Anodorhynchus hyacinthinus</i>			
Blue & Gold Macaw	2	0	0
<i>Ara ararauna</i>			
Scarlet Macaw	2	0	2
<i>Ara macao</i>			
Red-bellied Macaw	0	1(1)	1(1)
<i>Ara manilata</i>			
Golden Conure	0	13(3)	13(3)
<i>Aratinga guarouba</i>			
Grand Eclectus	2	0	2
<i>Eclectus r. roratus</i>			
Bronze-winged Parrot	0	3	3
<i>Pionus chalcopterus</i>			
Hooded Parrakeet	8	0	8
<i>Psephotus dissimilis</i>			
Derbyan Parrakeet	1(1)	0	1(1)
<i>Psittacula derbiana</i>			
Desmarest's Fig Parrot	0	1	1
<i>Psittaculirostris d. desmarestii</i>			
Thick-billed Parrot	5	0	5
<i>Rhynchopsitta p. pachyrhyncha</i>			
Thailand Bay Owl	0	2	2
<i>Phodilus b. badius</i>			
Spectacled Owl	0	3(2)	3(2)
<i>Pulsatrix p. perspicillata</i>			
White-backed Mousebird	2(1)	0	2(1)
<i>Colius colius</i>			
Speckled Mousebird	2	0	2
<i>Colius striatus</i>			
Guam Kingfisher	0	5(2)	5(2)
<i>Halcyon c. cinnamomina</i>			
Blue-breasted Kingfisher	1(1)	0	1(1)
<i>Halcyon malimbica</i>			
Indian Roller	4	0	4
<i>Coracias benghalensis indica</i>			
European Roller	2	2	4
<i>Coracias g. garrulus</i>			
Abyssinian Ground Hornbill	0	3	3
<i>Bucorvus abyssinicus</i>			
Northern Red-billed Hornbill	3	0	3
<i>Tockus e. erythrorhynchus</i>			

African Grey Hornbill	2	0	2
<i>Tockus nasutus</i>			
Black-spotted Barbet	2	0	2
<i>Capito n. niger</i>			
Double-toothed Barbet	6	0	6
<i>Lybius b. bidentatus</i>			
Crested Barbet	2(1)	0	2(1)
<i>Trachyphonus v. vaillantii</i>			
Loggerhead Shrike	0	12(2)	12(2)
<i>Lanius ludovicianus gambeli</i>			
San Clemente Loggerhead Shrike	0	4	4
<i>Lanius ludovicianus mearnsi</i>			
White-crowned Robin Chat	4	0	4
<i>Cossypha albicapilla</i>			
White-browed Robin Chat	8(2)	0	8(2)
<i>Cossypha heuglini</i>			
Ground-scraper Thrush	1	0	1
<i>Turdus litsipsirupa</i>			
Orange-headed Thrush	2	1(1)	3(1)
<i>Zoothera citrina</i>			
White-throated Laughing Thrush	5(1)	1(1)	6(2)
<i>Garrulax albogularis</i>			
Black-throated Laughing Thrush	13(6)	0	13(6)
<i>Garrulax chinensis</i>			
Yellow-throated Laughing Thrush	4(2)	4(2)	8(4)
<i>Garrulax galbanus</i>			
Red-tailed Laughing Thrush	5(2)	0	5(2)
<i>Garrulax milnei</i>			
White-browed Laughing Thrush	5(1)	0	5(1)
<i>Garrulax sannio</i>			
White-necked Laughing Thrush	1(1)	0	12(1)
<i>Garrulax strepitans</i>			
Red-faced Liocichla	2(1)	0	2(1)
<i>Liocichla phoenicea</i>			
Chestnut-backed Scimitar Babbler	2(2)	0	2(2)
<i>Pomatorhinus montanus</i>			
Striated Yuhina	1	0	1
<i>Yuhina castaniceps</i>			

Oriole Warbler	3(1)	0	3(1)
<i>Hypergerus atriceps</i>			
Malachite Sunbird	5(5)	0	5(5)
<i>Nectarinia famosa</i>			
Orange-billed Sparrow	6(1)	2(2)	8(3)
<i>Arremon aurantirostris</i>			
Yellow-faced Grassquit	13(4)	0	13(4)
<i>Tiaris o. olivacea</i>			
Golden-browed Chlorophonia	0	3(3)	3(3)
<i>Chlorophonia o. callophrys</i>			
Black-faced Dacnis	1	0	1
<i>Dacnis lineata</i>			
Yellow-throated Euphonia	6(2)	0	6(2)
<i>Euphonia hirundinacea</i>			
Spot-crowned Euphonia	7(2)	0	7(2)
<i>Euphonia imitans</i>			
Violaceous Euphonia	1(1)	1(1)	2(2)
<i>Euphonia violacea</i>			
Spangle-cheeked Tanager	1(1)	0	1(1)
<i>Tangara d. dowii</i>			
Silver-throated Tanager	9(4)	0	9(4)
<i>Tangara i. frantzii</i>			
Golden-masked Tanager	6(3)	2	8(3)
<i>Tangara larvata</i>			
Turquoise Tanager	2	0	2
<i>Tanager m. mexicana</i>			
Golden-crested Mynah	12(2)	0	12(2)
<i>Ampeliceps coronatus</i>			
Celebean Mynah	0	1(1)	1(1)
<i>Basilornis celebensis</i>			
Emerald Starling	2	0	2
<i>Lamprotornis iris</i>			
Rothschild's Mynah	3(3)	0	3(3)
<i>Leucopsar rothschildi</i>			
Grosbeak Starling	12(4)	4	16(4)
<i>Scissirostrum dubium</i>			
White-collared Starling	0	7	7
<i>Streptocitta albicollis</i>			
Thai Black Drongo	2	0	2
<i>Dicrurus macrocercus thai</i>			
Asiatic Azure-winged Magpie	0	9(6)	9(6)
<i>Cyanopica cyana swinhoei</i>			
Crested Jay	0	1(1)	1(1)
<i>Platylophus gallericulatus</i>			

## THE SOCIETY MEETING AT RODE - 1992

On Sunday 29th March 1992 members and their friends were invited by Donald and Betty Risdon and Mike and Norma Curzon to visit the Tropical Bird Gardens, Rode, Somerset. Despite a damp morning and a wet evening the duration of the visit for about 65 people was dry. Since the last Avicultural Society visit in the Spring of 1985 improvements and rebuilding have occurred during each winter. The most notable change occurred in January 1990 when the hurricane force winds uprooted or brought down over 100 trees several of which were over 100 years old. This resulted in the construction of a new range of aviaries for Owls.

The early time of our visit meant that some softbills were still in their winter quarters but the majority of the birds are out all the year with appropriate shelters being available in all the aviaries and enclosures. A new very large aviary has been built for a pair of full winged Secretary Birds which have a pair of Red-billed Blue Magpies for company. (The magpies have in fact bred this summer). We were able to view three East Africa Crowned Cranes bred last year which were still some way from obtaining their adult plumage.

In 1991 a pair of Golden-breasted Mynahs reared a single chick which is believed to be a first breeding in Great Britain. A Red-faced Liocichla may also be a first breeding. Parrots play an important part in the scene at Rode and last year three different species of Amazons were bred, Double Yellow-headed, Orange-winged and two pairs of Blue-fronted. The colony of Peach-faced Lovebirds is self sustaining. How nice to view this species as it looks naturally and not the mutations which are now so common.

Rode is world famous for its Macaws especially those at liberty and we were able to watch some of them in flight. Blue and Gold Macaws still reproduce annually. A recent feature at Rode has been the inter-change of birds with other collections which has enabled pairs to be made up. Surgical sexing also made a great contribution during the 1980's enabling "pairs" to be sexed and arrangements made to exchange/sell accordingly. Some of the uncertainty has thus been removed.

Hopes for 1992 are high especially with three species. A pair of Trumpeter Hornbills have been muddled in for the last three years but never any chicks or their remains have been found when the nest

is examined. Scarlet Macaws are very difficult to breed in comparison with Blue and Gold Macaws. The adult pair of Secretary Birds have laid but never hatched. Perhaps 1992 will bring success.

Already in 1992 Speckled Mousebirds have reared two young and this in the coldest spell during January and various waterfowl and pheasants were starting to lay.

Stewart Pyper

\* \* \*

## NEWS AND VIEWS

The first African Verreaux's Eagle to be bred in captivity is thriving on a diet of minced rats, baby chicks and quail at the National Birds of Prey Centre in Newent, Glos. (Daily Telegraph, 15th May 1992).

\* \* \*

Peter Olney, Curator of Birds and Reptiles at London Zoo, who was for several years a member of the Council of the Avicultural Society, has been appointed Director of the Federation of Zoological Gardens of Great Britain and Ireland.

\* \* \*

In 1991, a Jambu Fruit Dove was reared by a wild-caught pair of this very attractive species which has been in the Tropical House at Harewood Bird Garden since 1987.

\* \* \*

Why is it that many avicultural writers, who should know better, persist in using "specie" as if it were the singular of "species" and "psittacine" as if it were a noun?

\* \* \*

The Rothschild's Grackle studbook reports that, in 1991, more deaths occurred than there were chicks hatched and that the total number of birds of this species in aviaries in the United Kingdom

has fallen to about a hundred. In this context it is interesting to note that one of our overseas members has fifteen pairs in his aviaries!

\* \* \*

Recently, I received photographs of a lovely little bird owned by Lawrence Kuah, a member in Singapore. He had obtained several specimens from a collector working in Timor. It looks like some sort of Parrot Finch. The beak is black, the head and breast are cobalt blue, the flanks and abdomen are a lighter shade of blue, the wings are green, the tail coverts are bright red and the tail is maroon. Mike Fidler and Derek Goodwin recognised it immediately as the Tri-coloured Parrot Finch *Erythrura tricolor* which, in my ignorance, I had always believed to be one of the many races of the Blue-faced Parrot Finch *E. trichroa*. However, *E. tricolor* is described clearly on page 68 in *Parrot Finches* by Evans and Fidler. It appears that the species exhibits marked sexual dimorphism, the underparts of the female being turquoise fading to grey in the centre of the breast and abdomen. In *Parrot Finches* which was published in 1990 it is stated that the species is unknown to aviculture. Not any more! It is breeding successfully in aviaries in Holland at the present time.

\* \* \*

Chicks have been hatched at Birdland, Bourton-on-the-Water by a pair of Kelp Geese brought from the South Atlantic soon after the end of the Falklands war. This is probably the first occasion on which this species has been bred in captivity anywhere in the world.

\* \* \*

Last year eleven pairs of Californian Condors in the Los Angeles Zoo and the San Diego Animal Park laid a total of 22 eggs, 13 of which hatched successfully. The Condor population is now 50 in captivity and two released into the wild.

\* \* \*

It is a long time since the Kagu has been seen in any European aviary although Zoo specimens have been known to thrive for twenty to thirty years. This remarkable member of the many unusual species of birds of New Caledonia is about the size of a

bantam. Its plumage is mainly bluish-grey with the undersides of the wings, which it shows in aggression or display, striped red, white and black. Both sexes have attractive crests. It is now a seriously endangered species as a result, particularly, of deforestation and predation by introduced mammals. A conservation project in New Caledonia is being run by the International Council for Bird Preservation. A captive bred pair which reared a chick in 1988 was presented by the project team to the NogeYama Zoo in Yokohama where their breeding attempts in 1989 were unsuccessful but successful again in 1990 when they produced two chicks one of which, a male, was hand reared and the other, a female, reared by its parents.

\* \* \*

The Jersey Wildlife Preservation Trust continues to be successful in breeding the very rare and endangered Mauritius Pink Pigeon and last year (1991) 15 young birds were reared. The programme for their reintroduction to their natural habitat is well under way. It has been found already that the return of mature birds is fraught with problems because they are inclined to panic and get lost. On the other hand, young birds released in small groups tend to stay together close to the release aviaries until they become accustomed to their new environment and capable of finding wild food for themselves. Some are breeding already although only three chicks were known to have been reared successfully last year probably because of nest predation by rats.

\* \* \*

It is now about two years since Harry Horswell and his wife, Mary, died and Geoffrey Greed took over as Secretary of the Avicultural Society. The Society was then in a parlous state and its survival has been dependent almost entirely upon the financial and practical assistance given by Bristol Zoo, its Director Geoffrey Greed and some members of his staff. This is an appropriate time to record our sincere thanks to them for their efforts to ensure the continued existence of the Avicultural Society and the publication of its magazine.

Ed.

\* \* \*

## APOLOGY

Robin Restall has drawn my attention to errors in his article entitled "Observations on the Grey-headed Mannikin *Lonchura caniceps* and the Chestnut-breasted Mannikin *Lonchura Castaneothorax* in the Port Moresby Area" which appeared in volume 98 number 2 pages 51 - 57 of the Avicultural Magazine for which the editor offers his sincere apologies.

They were as follows:

1. Page 55 The first paragraph is misplaced and should appear between ....plumage." and "Despite Immelmann's ..." on line 25 of that page.

2. Page 56 The following eight lines were missing from the top of the page "...they were bedding down for there was much muttering of soft mewing *wee* notes and others including the *zeet-a-zeet* song referred to above. They roosted by their own biological clock and not because I covered them up, in fact I had not altered the lighting in the room.

### Comparative Comments

There is a school of thought that believes the Chestnut-breasted Mannikin and the Grey-headed Mannikin are conspecific. They ..."

He has asked for the addition to the same article of the following references:

DIAMOND, J. M. and LECROY, M., 1979. *Birds of Karkar and Bagabag Island, New Guinea*. Bull. Amer. Mus. Nat. Hist. 164: 467 - 531.

JONKERS, B., and ROERSMA, H., 1990. New Subspecies of *Lonchura spectabilis* from East Sepik Province, Papua New Guinea. *Dutch Birding* 12 (1) 22 - 25.

\* \* \*



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